001

51647

FINAL RECORD OF DECISION
SOILS AND GROUNDWATER OPERABLE UNIT
ARMY MATERIALS TECHNOLOGY LABORATORY
WATERTOWN, MASSACHUSETTS

Contract No. DAAA15-90-D-0009

September 1996

Prepared by:

Roy F. Weston, Inc.
Weston Way
West Chester, Pennsylvania 19380-1499

Work Order No. 02281-011-001

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF FIGURES

ACRONYM LIST

AEC	Army Environmental Center
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EC_{50}	effective concentration for 50% of the test organisms
EPA	U.S. Environmental Protection Agency
FFA	Federal Facilities Agreement
FS	Feasibility Study
GSA	General Services Administration
IRP	Installation Restoration Program
LC_{50}	lethal concentration for 50% of the test organisms
MADEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
mg/kg	milligram per kilogram
MTL	Materials Technology Laboratory
NCP	National Contingency Plan
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
O&M	operation and maintenance
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
POL	petroleum, oil, and lubricants
ppb	parts per billion
ppm	parts per million
RA	risk assessment
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SVOC	semivolatile organic compound
TBC	To Be Considered
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
UCL	upper confidence limit
UST	underground storage tank
VOC	volatile organic compound

DECLARATION FOR THE

RECORD OF DECISION

I. DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Soils and Groundwater
Army Materials Technology Laboratory
Watertown, Massachusetts

STATEMENT OF PURPOSE AND BASIS

This decision document presents the U.S. Army's selected remedial action for soils and groundwater at the Army Materials Technology Laboratory (MTL), Watertown, Massachusetts. It was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, 42 USC 9601 *et seq.* and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, to the extent practicable. The MTL Base Realignment Closure Environmental Coordinator; the Chief of Staff at Army Materiel Command; and the Director of the Office of Site Remediation and Restoration, U.S. Environmental Protection Agency (EPA) Region I have been delegated the authority to approve this Record of Decision.

This decision is based on the Administrative Record that has been developed in accordance with Section 113(k) of CERCLA. The Administrative Record is available for public review at the MTL Base Realignment and Closure (BRAC) Office, Building 313, 395 Arsenal Street, Watertown, Massachusetts, and at the Main Branch of the Watertown Public Library, Watertown, Massachusetts. The Administrative Record Index identifies each of the items considered during the selection of the remedial action. This index is included in Appendix A.

ASSESSMENT OF THE SITE

Actual or potential releases of hazardous substances from soil areas, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to the public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This remedial action addresses long-term residential and commercial exposure to contaminated soil. It consists of excavating the contaminated soil and transporting the soil for off-site disposal and/or reuse. Excavations are to be backfilled with clean soil. Once contaminated soil is removed, the bottom and sidewalls of the excavation areas will be sampled and analyzed to ensure that site cleanup goals are met. The remedy eliminates the source of the contamination and reduces the potential risk to residents and workers at MTL. The remedy is consistent with the overall remedial strategy for MTL. This remedy was presented as the contingency remedy in the Proposed Plan.

STATE CONCURRENCE

The Commonwealth of Massachusetts has concurred with the selected remedy. Appendix B of this Record of Decision contains a copy of the Declaration of Concurrence.

DECLARATION

The selected remedy is consistent with CERCLA and to the extent practicable the NCP, is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. The remedy uses a permanent solution for soil contamination. This remedy does not satisfy the statutory preference for treatment as a principal element. This remedy will not result in hazardous substances, above cleanup goals, remaining at MTL.

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

ROBERT E. CHASE
BRAC Environmental Coordinator

9/18/96
Date

The fore going represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

BILLY J. SOLOMON
Major General, USA
Chief of Staff
U.S. Army Material Command

25 Sep 96
Date

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

Linda M. Murphy

LINDA M. MURPHY
Director, Office of Site Remediation and Restoration
U.S. Environmental Protection Agency, Region I

Sept. 24, 1996
Date

II. SITE NAME, LOCATION, AND DESCRIPTION

Army Materials Technology Laboratory Site
Watertown, Massachusetts

The MTL property is located on 48 acres of land in Watertown, Massachusetts, on the north bank of the Charles River, approximately 5 miles west of downtown Boston (see Figure 1). The installation is bounded on the north by Arsenal Street, on the south by the Charles River, on the east by Talcott Avenue, and on the west by the Veterans of Foreign Wars, USA, Burnham Manning Post No. 105, and private property (see Figure 2). Figure 2 also shows the proposed reuse zones—Zones 1 through 3 represent developed areas of the site, and Zone 4 and River Park represent undeveloped areas. MTL formerly contained 15 buildings and 15 associated structures. Included in the U.S. Army-owned Superfund site are 11 acres of land south of the enclosed portion of the installation and abutting the Charles River. This land consists of a public park and a yacht club south of North Beacon Street. The Commonwealth of Massachusetts has been granted an easement to this property.

The overburden deposits of the MTL site generally consist of (in ascending order) basal glacial till directly overlying bedrock, silty clay with some fine sand and gravel, interlayered outwash deposits of sand and gravel with some fine materials, and fill near the surface. In general, depth to groundwater is within 5 to 10 ft of the ground surface along the southeastern boundary of the facility adjacent to the Charles River. Depth to groundwater reaches a maximum of approximately 30 ft below ground surface (bgs) along the eastern boundary of the site, where the ground surface reaches its maximum elevation and coarse-grained deposits allow rapid soil drainage. Depth to groundwater in the central portion of the facility is on the order of 15 to 20 ft bgs for shallow wells and 20 to 25 ft bgs for deep (A-series) wells. Groundwater flow in both the deep and shallow overburden is south-southeast toward the Charles River (see Figure 3). The site groundwater meets the Commonwealth of Massachusetts definition of a nondrinking water aquifer (GW-3); therefore, there is no risk of exposure to human receptors. With the exception of a small part of the River Park, the site is not located within the Charles River 100-year floodplain, and there are no wetlands on-site. A more complete description of the site is presented in Sections 1 and 3 of the Remedial Investigation (RI) report (WESTON, 1994).

Because of the complexity of this site, the site has been divided into three distinct operable units, which are being handled separately. The first operable unit is for the outdoor areas of the site, specifically soil and groundwater. This Record of Decision addresses this operable unit. A separate CERCLA Record of Decision was signed in June 1996 to expedite the cleanup of a small area of soil contamination adjacent to Building 131. This expedited cleanup was implemented to facilitate future reuse. Contamination as a result of releases of petroleum, oil, and lubricants (POL) is not considered part of the evaluation of this operable unit because remedial actions under CERCLA do not extend to POL. Actions required to address POL are being conducted under the jurisdiction of the Massachusetts Department of Environmental Protection (MADEP). The second operable unit is for the remediation of site buildings, which is being performed under state cleanup authority. A Massachusetts Contingency Plan (MCP) Phase III Remedial Action Plan for the site buildings was submitted to MADEP in January 1996. The third operable unit involves Charles River surface water and sediments. Investigation of the Charles River is being implemented by the Army under CERCLA with EPA as the lead agency. Any future activities for the Charles River operable unit will not impact site reuse.

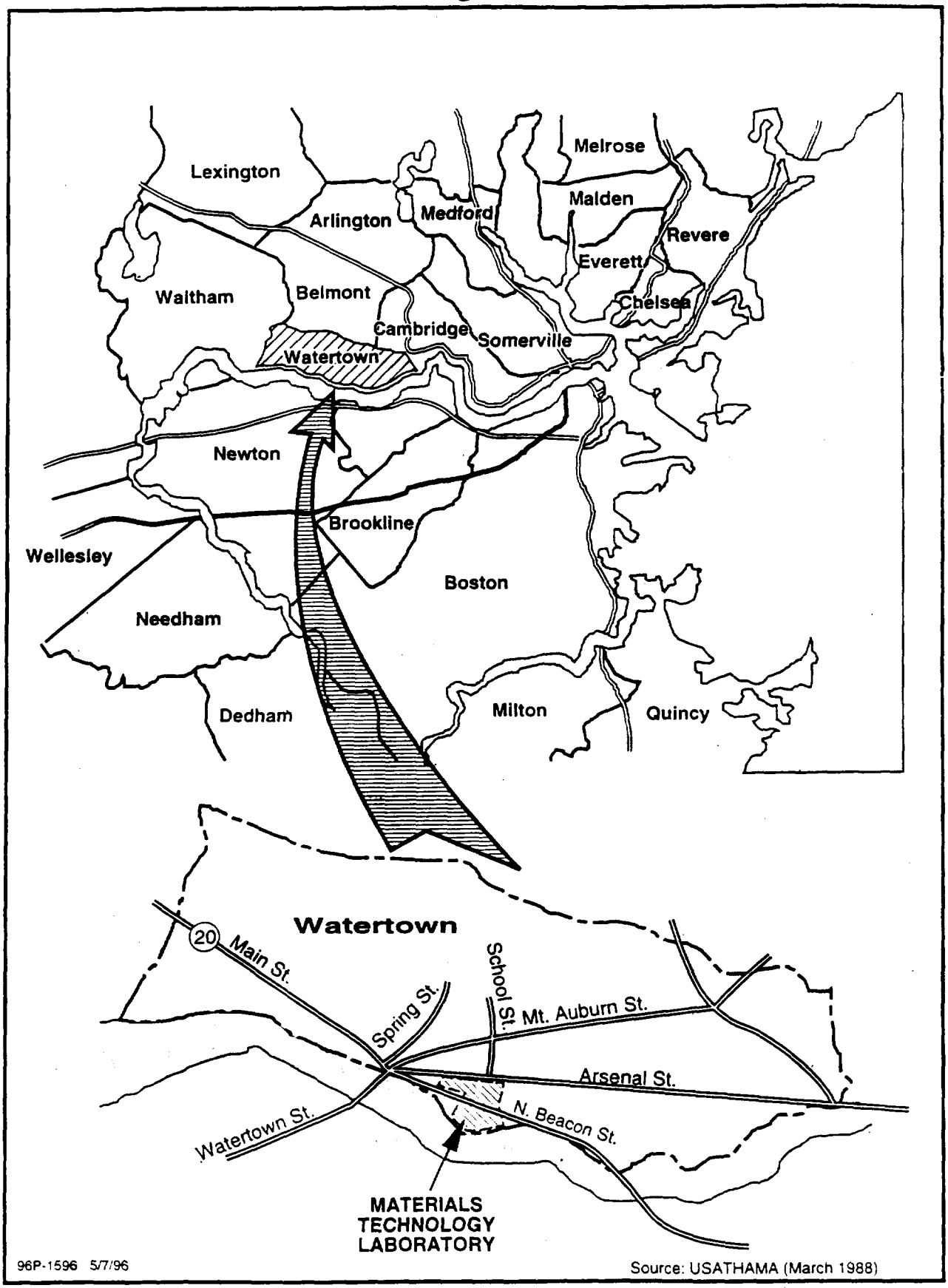
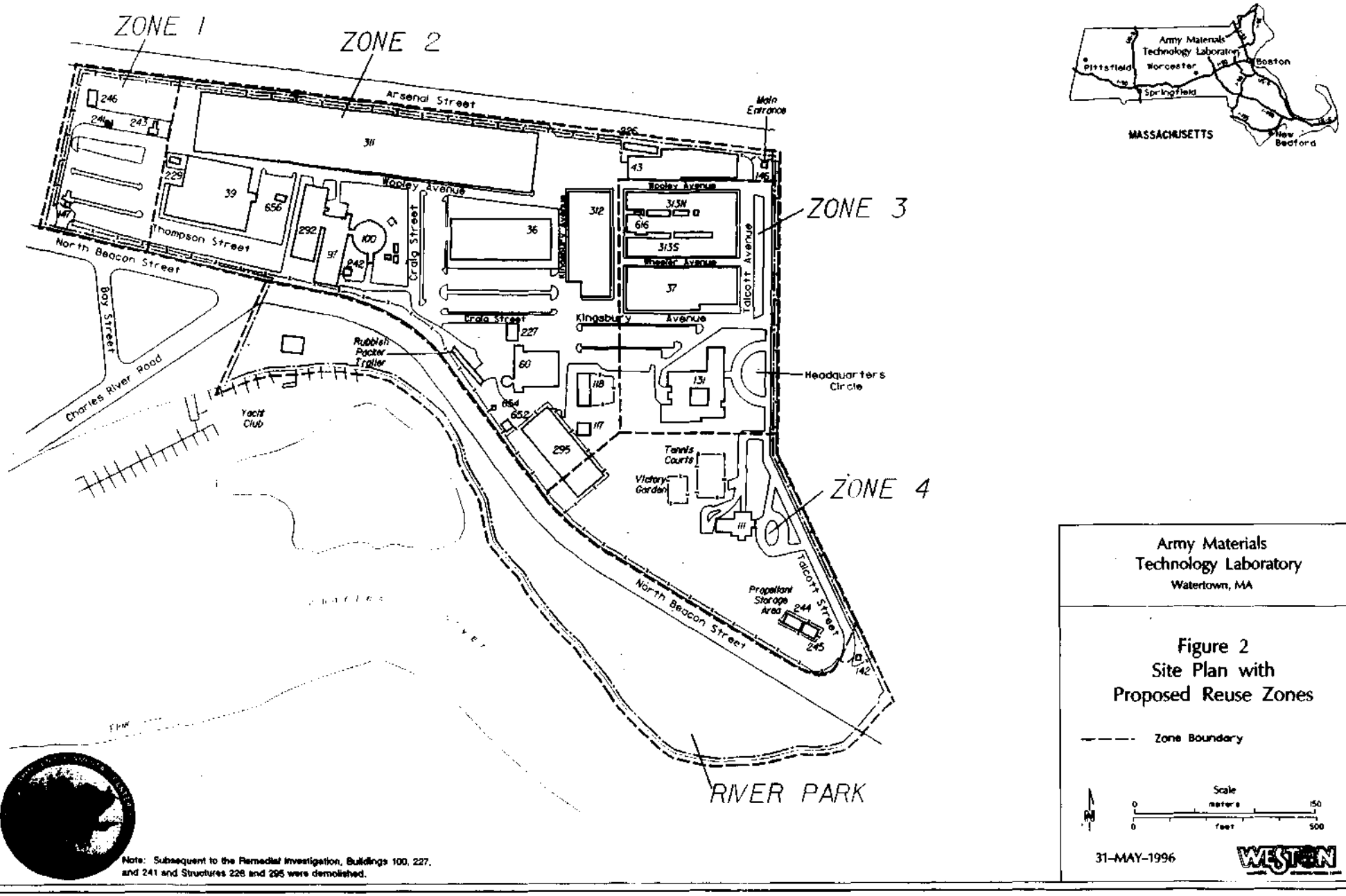


FIGURE 1 LOCATION OF MTL



Note: Subsequent to the Remedial Investigation, Buildings 100, 227, and 241 and Structures 226 and 295 were demolished.

Army Materials
Technology Laboratory
Watertown, MA

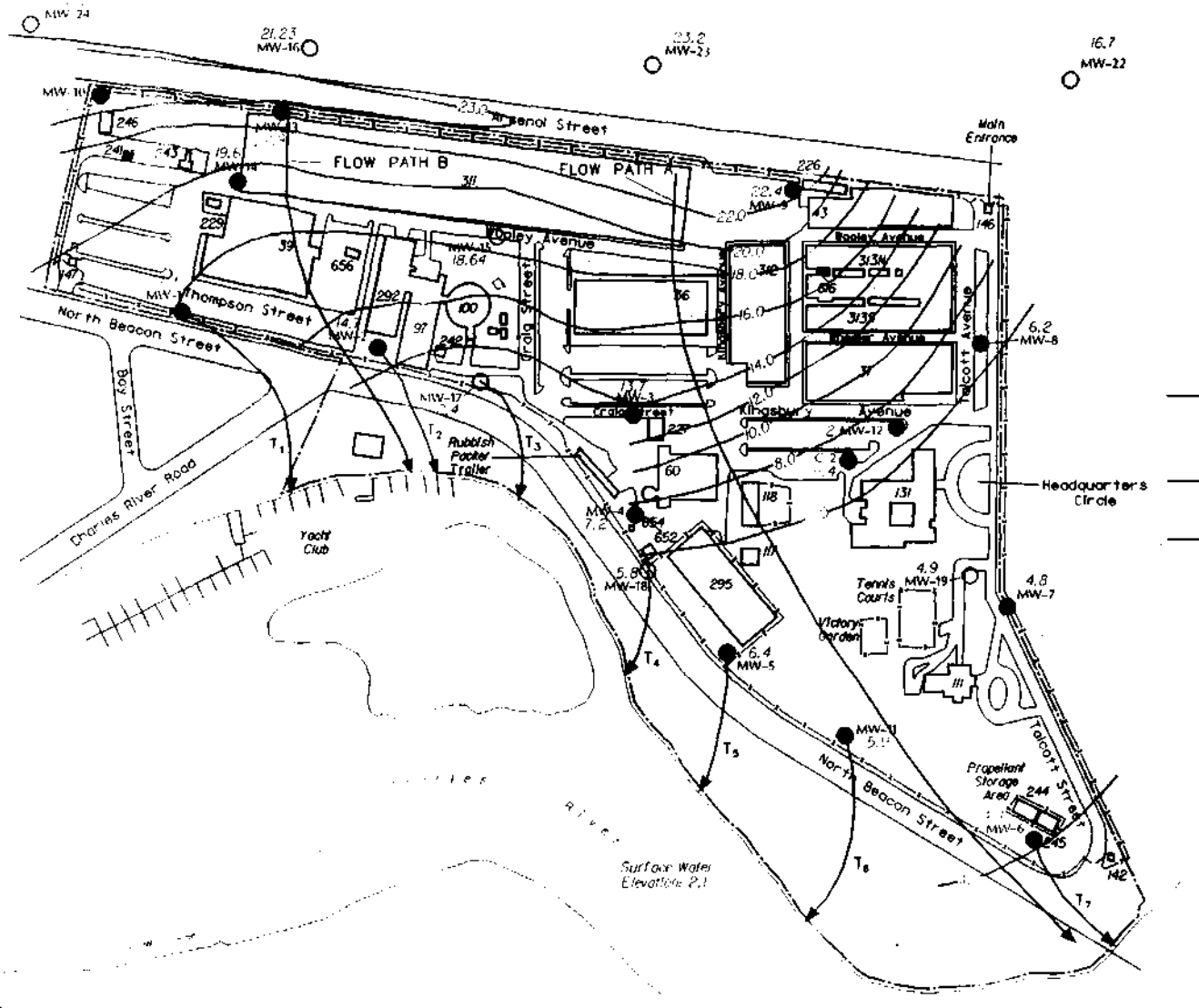
Figure 2
Site Plan with
Proposed Reuse Zones

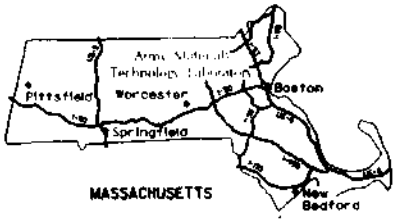
Zone Boundary

Scale
0 meters 150
0 feet 500

31-MAY-1996

WESTON





- Phase 1 Monitor Well
- Phase 2 Water Table Monitor Well
- 6.0 — Groundwater elevation in feet, based on 09-Dec-1991 water level measurements. All elevations referenced to National Geodetic Vertical Datum of 1929.
- Flow Path A and Flow Path B used to calculate the hydraulic gradient across the site.
- Flow Paths T_1 through T_7 used to calculate estimates of travel times between down gradient property line wells and the Charles River.

Army Materials Technology Laboratory
Watertown, MA

Figure 3
Groundwater Contours Water Table Wells

Scale
meters 0 150
feet 0 500

31-MAY-1996

WESTON

Note: Subsequent to the Remedial Investigation, Buildings 100, 227, and 241 and Structures 226 and 295 were demolished.

III. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Response History

The Watertown Arsenal facility has been in operation since 1816. It was established for the purposes of storage, repair, cleaning, and issue of small arms and ordnance supplies. Throughout the 1800s and until World War II, the installation's mission was continually expanded to include weapons development and production, and materials research experimentation and development. At the height of its activity (just after World War II), the site encompassed 131 acres with 53 buildings and structures and employed 10,000 people. In 1960, the Army's first nuclear research reactor was constructed, and it was used in research activities until its deactivation in 1970. Depleted uranium machining, milling, forging, and casting also were conducted on-site. Decommissioning of the reactor in accordance with the Nuclear Regulatory Commission (NRC) standards has been completed.

An operational phaseout of the arsenal was begun in 1967. At that time, approximately 55 acres of land were sold to the Town of Watertown, and 28.5 acres were transferred to the General Services Administration (GSA). At that time, the 48-acre MTL site was created from the remaining arsenal land. The parcel sold to Watertown currently contains a shopping mall, condominiums, and a public park and playground. Land transferred to GSA has undergone various improvements, including paving in some portions.

Previous investigations that pertain to environmental conditions at MTL were completed between September 1968 and December 1987. In 1987, the Army Environmental Center (AEC) initiated additional environmental investigations under the Army's Installation Restoration Program (IRP). A Preliminary Assessment/Site Inspection completed in 1988 was performed as the first step of this program. In December 1988, MTL was included on a list of U.S. Department of Defense installations recommended for closure; this list was subsequently approved by Congress. In March 1989, AEC was assigned responsibility for centrally managing the BRAC Environmental Restoration Program.

Although unrelated to the Superfund process, several cleanup activities have occurred at the MTL site. In 1991, six on-site underground storage tanks (USTs) were removed. Also in 1991 during the RI, a fuel oil leak was discovered at Building 227. A leaking oil line was repaired and contaminated soil was excavated to a 14-ft depth next to the building. Excavation ceased when it was determined that building structural damage would occur under continued excavation. The excavation was backfilled after approval by MADEP. Residual contamination exists, and continued cleanup efforts are under the jurisdiction of MADEP under the MCP. Because Section 101(14) of CERCLA contains an exclusion for petroleum, the cleanup of petroleum-contaminated soils at MTL is being conducted under MADEP jurisdiction and is not addressed in this Record of Decision.

The Army also has completed decommissioning of the nuclear reactor, and low-level radioactive waste has been removed. In 1994, sitewide radiological decontamination was completed to meet cleanup standards set by NRC, MADEP, and the Massachusetts Department of Public Health. Asbestos removal also has occurred in some of the site buildings.

In addition to the work previously completed, the Army will be conducting remediation of chemical contamination of interior building surfaces. For more information on this issue, refer to the Phase III Remedial Action Plan. Concurrent with this remediation, the Army will be

removing any loose and/or flaking lead paint. The Army's effort will comply with the Department of Public Health's lead paint requirements. Additionally, the Army will provide lead paint notification as a property transfer requirement.

B. Enforcement History

The following list summarizes the significant dates in relation to environmental studies, remediation, and base closure at MTL:

- MTL was first listed by MADEP as a Location To Be Investigated on January 15, 1987.
- A Phase 1 RI was completed in April 1991.
- MTL was subsequently confirmed as a disposal site by MADEP on January 15, 1992.
- A Phase 2 RI was completed in May 1994.
- In July 1993, the site was proposed for inclusion on the National Priorities List (NPL) under Superfund; the site was added to the NPL on May 30, 1994.
- A Federal Facilities Agreement (FFA) between the Army and EPA became effective on July 25, 1995.
- The installation was officially closed on September 29, 1995.
- The FS for the Outdoor Operable Unit was completed in January 1996.
- A Record of Decision for Area I was signed June 28, 1996.

IV. COMMUNITY PARTICIPATION

Throughout the site's history, community concern and involvement have been high. The MTL Public Affairs Office has been active in responding to requests for information, concerns, and questions from the community. In March 1989, the Watertown Town Manager, in conjunction with the Town Council, formed the Watertown Arsenal Reuse Committee to study the community impact of the MTL closure. In addition, the MTL Restoration Advisory Board (RAB) was established in January 1994 to facilitate the exchange of information between MTL and the community. RAB members include members of the Army, EPA and state regulatory officials, and members of the community. MTL, EPA, and MADEP officials have participated in meetings of the Watertown Arsenal Reuse Committee as well as Town Council meetings, conducted public site tours, and have met with a number of community leaders and environmental and community organizations. The Army also has kept the community and other interested parties apprised of the site activities through fact sheets and press releases.

On June 7, 1991, the Army held an informational meeting in Watertown to discuss the results of the Phase 1 RI.

In February 1992, the Army released a Public Involvement and Response Plan outlining a program to address community concerns and keep citizens informed about and involved in activities during remedial activities. The Army revised and updated this plan, and in May 1995 released an updated Community Relations Plan, which summarized information about the environmental studies, identified community concerns, and outlined additional community relations activities.

In November 1993, the MTL Reuse Plan was completed by Goody, Clancy, and Associates. This plan was prepared for the Town of Watertown and the Watertown Arsenal Reuse Committee. Within this plan, the site was divided into zones that could be reused for commercial or residential development. The land reuse scenarios developed in this plan were based on input from the Town Council. The Reuse Plan was approved and accepted by the Town Council in January 1994.

On June 24, 1996, the Army made the administrative record available for public review at the installation and the Watertown Public Library. A copy of the Administrative Record Index is on file at the EPA's office in Boston. The Army published a notice and brief analysis of the Proposed Plan in *The Watertown Sun* on May 1 and May 8, 1996, and *The Watertown Press* on May 2 and May 9, 1996, and made the plan available to the public in the Administrative Record.

On April 16, 1996, the Army held an informational meeting to discuss the results of the RI and the cleanup alternatives presented in the FS and to present the Proposed Plan. During this meeting, the Army answered questions from the public. From April 22 to May 22, 1996, the Army held a 30-day public comment period to accept public comments on the alternatives presented in the FS and the Proposed Plan, and on any other documents released previously to the public. On May 13, 1996, the Army held a public hearing to discuss the Proposed Plan and to accept any oral comments. A transcript of this meeting, the comments received, and the Army's response to comments are included in the attached responsiveness summary in Appendix C.

V. SCOPE AND ROLE OF RESPONSE ACTION

For the MTL Soils and Groundwater Operable Unit, a selected remedy has been identified. The selected remedy (S6) includes:

- Excavating contaminated soil.
- Off-site disposal or reuse of the soil.
- Backfilling the excavations with clean soil.

The selected remedy is described in greater detail in Section VIII. This remedial action will address soil contamination, which is the principal threat to human health and the environment posed by this operable unit of the site.

The Army has selected the contingency alternative (Alternative S6) from the Proposed Plan. The remedy selection was due to two factors: the cost of remediation for Alternative S6 and the Town of Watertown's desire for a more expedited remediation schedule. The rationale for the change in remedy selection is described in greater detail in Section XIII.

VI. SUMMARY OF SITE CHARACTERISTICS

Section 1 of the FS contains an overview of the RI. The significant findings of the RI specific to this operable unit are summarized in the following sections.

A. Soil Investigation

Soil investigation results are as follows:

- Soil samples collected from beneath concrete floors in Buildings 43, 311, and 312 showed elevated concentrations of semivolatile organic compounds (SVOCs). Contaminant concentrations were generally highest at the ground surface.

- Elevated concentrations of polynuclear aromatic hydrocarbons (PAHs) were detected in soil samples collected from borings completed in the grassy area between North Beacon Street and the Charles River. The highest levels of PAHs were detected adjacent to Buildings 39 and 227/60, and in the parking lot between Buildings 37 and 131 (see Figure 4). The maximum concentration of total PAHs detected was 99 parts per million (ppm).

- Polychlorinated biphenyls (PCBs) were detected at levels above the EPA action level of 1 ppm (maximum concentration of 4.9 ppm) at two site locations, near Structure 244/245 (propellant storage area), and at the eastern fenceline, approximately 100 ft east of the tennis courts (see Figure 4).

- The analytical results showed that the total uranium activity in all soils was below the federal maximum allowable standards.

- Metals concentrations (primarily lead) had their highest concentrations reported in shallow (less than 1 ft bgs) soil samples collected from immediately outside Buildings 39, 43, 311, 313, and 656, with a maximum lead concentration of 7,200 ppm (mg/kg).

- Pesticides were detected in surface soil samples, particularly in the grassy areas in the southeastern and central portions of the site and along the southern fenceline (maximum total pesticide concentration of 11 ppm).

In regard to the removal at Building 227 of soil contaminated by a fuel leak, analysis of excavated soils indicated the presence of fuel-related compounds. Excavation of soil was stopped when it was determined that structural damage to the building would occur if excavation continued. Residual fuel-contaminated soil remains and has yet to be fully characterized. Because Section 101(14) of CERCLA contains an exclusion for petroleum, the cleanup of petroleum-contaminated soils at MTL is being conducted under MADEP jurisdiction and is not addressed in this Record of Decision.

B. Groundwater Investigation

With the exception of one well, all upgradient wells showed detectable quantities of chlorinated solvents, which suggests that off-site sources have caused or aggravated on-site groundwater contamination. Chlorinated solvents identified in these wells include tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA), with a maximum total volatile organic

compound (VOC) concentration detection in a single well of 14,000 parts per billion (ppb). In addition, one upgradient well showed elevated concentrations of gasoline-related VOCs.

Based on a site water table map, groundwater flow paths indicate the potential for groundwater to flow away from the site in an area in the northwestern part of the site before flowing toward the Charles River (see Figure 3). No evidence of on-site contamination migrating off-site was found in groundwater samples collected from on-site wells because the majority of contamination was detected in the upgradient wells. The on-site farthest downgradient wells bordering the Charles River showed the lowest level of contamination. Most likely, a groundwater divide exists under a short stretch of Arsenal Street near the northwestern corner of the site, but groundwater does not flow from the site to the north of Arsenal Street.

Chlorinated solvents, including TCE and PCE, were detected in groundwater samples collected from 13 on-site monitor wells. Monitor wells located in the western portion of the site reported the highest concentrations of TCE (93 ppb) and PCE (94 ppb). Few exceedances of drinking water standards occurred.

Elevated concentrations of 1,3-dimethylbenzene (1,700 ppb) and other xylenes (1,400 ppb) were detected in one well located in the central portion of the site. Based on a petroleum odor present during groundwater sampling, contamination is believed to be the result of a fuel release. Analytical results from nearby monitor wells suggest the elevated concentrations are restricted to the area around this well.

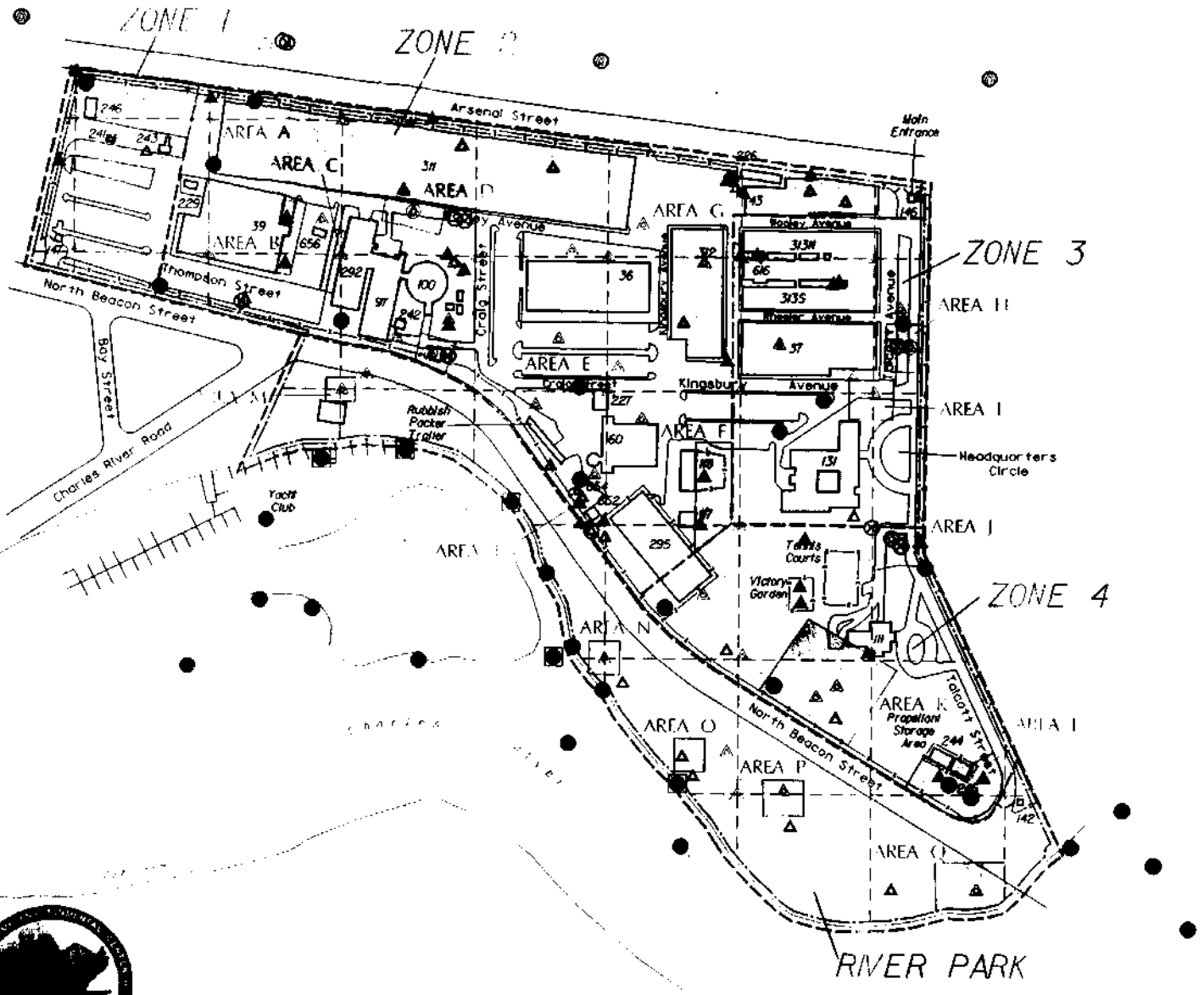
During drilling of a soil boring beneath the Building 36 parking lot, several inches of free-phase product was observed at the water table. Analysis of a soil sample collected at the water table indicated that the contaminant was a fuel oil product. The sample did not contain the more commonly known gasoline-related compounds, but it did contain certain compounds found in heavier oils. This oil may be resulting from a pipe release in the area of Building 227, as previously mentioned. The results of groundwater samples collected from downgradient monitor wells did not contain evidence of the free-phase product, indicating that there has not been contaminant migration in this direction. Because Section 101(14) of CERCLA contains an exclusion for petroleum, any cleanup of petroleum-contaminated groundwater at MTL is being conducted under MADEP jurisdiction and is not addressed in this Record of Decision.

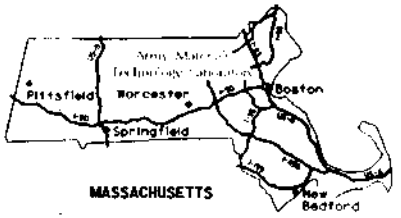
C. Storm Sewer Investigation

The storm sewers contained little or no sediment; therefore, only liquid samples were obtained during the rain event. The sampling results indicate that the site contributes small amounts of some metals and pesticides to the storm sewer runoff. These metals include copper and zinc (maximum detected values of 600 and 500 ppb, respectively), both of which exceed site background values and the typical urban runoff range for these metals. Pesticide concentrations exceeding background concentrations include alpha-, beta-, and delta-BHC; chlordane; DDE; and methoxychlor, with a maximum total pesticide detection value of 0.9 ppb. No radiological contamination was detected in storm sewer runoff.

D. Sanitary Sewer Investigation

Uranium contamination was detected in several manholes on North Beacon Street and Arsenal Street (maximum radiological value of 73 pCi/g). On Arsenal Street, uranium was detected in a manhole connected to the drainlines from Building 43. Because uranium concentrations in two





- Phase I Surface Soil Sampling Location
- Surface Soil Sampling Location
- Soil Boring Location
- Soil Boring/Monitor Well Location
- Soil Sampling Grid
- Pre-Existing Monitor Well
- Phase 2 Monitor Well
- Phase 2 Deep Monitor Well
- Sediment and Surface Water Sampling Location
- Shallow and Deep Sediment Sampling Location (and Surface Water Sampling Location in some cases)
- Building where Chemical Wipe Samples were collected

Army Materials Technology Laboratory
Watertown, MA

Figure 4

Commercial and Residential Reuse Estimation of Areas to be Remediated

- Zone Boundary
- Estimated Area to be Remediated

Scale
0 meters 150
0 feet 500

31-MAY-1996

WESTON

Note: Subsequent to the Remedial Investigation, Buildings 100, 227, and 241 and Structures 228 and 295 were demolished.

manholes upstream of Building 43 were lower, the contamination in the manhole connected to the drainlines from Building 43 appeared to have been augmented by former sources in Building 43. The storm sewer lines and sanitary sewer lines are separate systems; there are no sanitary sewer outfalls on-site from MTL to the Charles River.

In a separate remediation to remove radiological contamination, manholes along North Beacon Street, Arsenal Street, and exiting Buildings 312 and 43 were remediated. A subsequent radiological survey of the sewer line along Arsenal Street showed no remaining radiological contamination. The results are being reviewed by the NRC to determine whether any additional measures are required.

A complete discussion of site characteristics is presented in the RI Report, Section 4.

VII. SUMMARY OF SITE RISKS

A risk assessment (RA) was prepared as part of the RI for the MTL site. The RA determines the present and future potential risks to human health and the environment posed by the site based on existing conditions as determined by the RI. Separate RAs were conducted for risks to human and ecological receptors from site soils. The human health RA was conducted for the entire site; the ecological risk assessment was conducted only for undeveloped areas of the site (i.e., the southern portion of the installation near the Commander's quarters and the 11-acre River Park on the southern side of North Beacon Street). It was concluded that the major risk to human health and the environment could result from incidental ingestion of and dermal contact with contaminated soils. Soil contaminants identified as requiring risk reduction include PAHs, pesticides, and PCBs. In addition, the ecological RA identified certain metals as contaminants of concern, but concluded that sitewide concentrations in soil are predominantly at normal background conditions. There are localized areas that may pose a risk to ecological receptors.

No RA was performed for groundwater because of a lack of receptors. Although some contamination is present in certain areas of on-site groundwater, this does not pose a current risk because the groundwater is not used as a water supply, and no significant migration of contamination is occurring in off-site groundwater. The site groundwater meets the Commonwealth of Massachusetts definition of a nondrinking water aquifer (GW-3) as defined in 310 CMR 40; therefore, there is no risk of exposure to human receptors. Groundwater does discharge from the site into the Charles River. Therefore, a model of contaminant contribution via groundwater to the Charles River was developed. This model, as presented in the FS, shows that no significant concentrations of contaminants migrate to the river from site groundwater. Hence, there is no apparent risk to human health or the environment from site groundwater. Based on the preceding information, no remediation of MTL groundwater is necessary.

A separate RA was conducted for human receptor exposure to the storm and sanitary sewer lines. The only applicable exposure pathway was for exposure of sewer workers. The RA concluded that there was no significant risk to sewer workers from exposure to contaminants in the sewer water or sediments.

At the time the soil RAs were prepared, the future use of the site (commercial or residential) was undetermined. The site was divided into five unit areas, as shown in Figure 2. The MTL installation was divided into four zones (Zones 1 through 4). The fifth unit was the 11-acre park south of the installation (River Park). Zones 1 through 3 represent developed areas of the site, and Zone 4 and River Park represent undeveloped areas.

The RAs evaluated each unit separately and determined contaminants of concern for each unit for each possible site reuse scenario. The human health RA evaluated Zones 1, 2, and 3 for commercial and residential reuse; Zone 4 for residential reuse and public use; and the River Park for public use only. The ecological RA evaluated only Zone 4 and River Park because these areas were considered the only potential ecological habitats on-site.

The RAs were performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the contaminated site soil. The human health and ecological RAs followed a four-step process:

1. Contaminant identification, which identified those hazardous substances that, given the specifics of the site, were of significant concern.

2. Exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure.

3. Toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances.

4. Risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances in the soil, including cancer and noncancer risks.

The results of the human health RA for this operable unit are discussed in the following subsections, followed by the conclusions of the ecological RA.

A. Human Health Risks from Site Soils

Fifteen contaminants of concern were selected for evaluation in the RA (see Table 1). These contaminants constitute a representative subset of the more than 40 contaminants identified at the site during the RI. Summaries of the health effects of each of the contaminants of concern are presented in Appendix R of the RI. The RA was originally conducted outside of the CERCLA program and some aspects of the RA do not strictly adhere to current guidance. However, these differences did not affect the overall outcome of the RA.

Potential human health effects associated with exposure to the contaminants of concern were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site. As stated previously, the site was divided into five different units—Zones 1 through 4 and River Park. An assessment was performed for each possible reuse; Zones 1 through 3 were assessed for commercial and residential reuse; Zone 4 was assessed for residential and public access reuse; and River Park was assessed for public access only. The following is a summary of the exposure pathways evaluated. A more thorough description is presented in Section 6 of the RI.

For future site residents, incidental soil ingestion and dermal contact were evaluated for the individual young child (age 1 to 2 years) for 1 year, child (age 1 to 8 years) for 7 years, and adult for 30 years. Resident exposure was based on 153 days per year for soil ingestion and 107 days per year for dermal contact. Adult and child visitors in Zone 4 were evaluated for soil exposure of 56 days for a 1-year duration. Adult and child visitors to River Park had the same soil exposure scenario as Zone 4 visitors, but also included incidental ingestion and dermal contact with Charles River surface water and sediments during swimming activities; exposure was based on 56 days for a 1-year exposure. Exposure for commercial workers was based on soil ingestion and dermal contact for 250 days per year for 25 years. Exposure for construction workers was based on soil ingestion and dermal contact for 18 days over a 1-year period.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level with the chemical-specific cancer factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative upper bound of the risk posed by potentially carcinogenic compounds. That is, the true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g., 1E-06 for 1 in 1,000,000) and indicate (using this example) that an average individual is not likely to have greater than a 1-in-1-million chance of developing cancer over 70 years as a result of site-related exposure to the compound at the stated concentration.

Table 1

Summary of Soil Contaminants of Concern

Contaminant of Concern	Site Soils		Background Soils	
	Geometric Mean Concentration (mg/kg)	Maximum Concentration (mg/kg)	Geometric Mean Concentration (mg/kg)	Maximum Concentration (mg/kg)
Benzo(a)anthracene	3.7E-01	3.2E+01	8.3E-02	6.1E+00
Benzo(a)pyrene	8.2E-01	3.7E+01	7.9E-01	6.8E+00
Benzo(b)fluoranthene	5.3E-01	1.5E+01	3.3E-01	7.6E+00
Benzo(k)fluoranthene	4.1E-01	2.4E+01	1.5E-01	6.3E+00
Chlordane	1.8E-01	9.4E+00	5.8E-02	1.9E+00
Chrysene	3.2E-01	3.4E+01	7.3E-02	9.2E+00
DDD	1.1E-02	3.5E+00	2.1E-03	4.7E-02
DDE	1.6E-02	6.3E+00	2.6E-03	2.5E-01
DDT	3.8E-02	5.2E+00	4.0E-03	1.9E-01
Dibenz(a,h)anthracene	2.1E-01	3.3E+00	1.9E-01	9.7E-01
Dieldrin	1.0E-02	4.0E+00	2.5E-03	6.7E-02
Heptachlor epoxide	7.2E-03	8.7E-01	1.4E-03	2.4E-01
Indeno(1,2,3-cd)pyrene	1.1E+00	1.4E+01	1.5E+00	7.7E+00
Aroclor-1260	5.9E-02	4.9E+00	3.6E-02	1.6E+00

Current regulatory practice considers cancer risks to be additive when assessing exposure to a mixture of hazardous substances.

A hazard index also was calculated for each pathway as the measure of the potential for noncancer health effects. The hazard index for a pathway is determined by using the sum of the hazard quotients for each contaminant in that specific pathway. A hazard quotient for each contaminant is calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for noncancer health effects for an individual compound. Reference doses have been developed by EPA to protect sensitive individuals over the course of a lifetime, and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The hazard quotient is often expressed as a single value (e.g., 0.3) indicating the ratio of the stated exposure as defined to the reference dose value (in this example, the exposure as characterized is approximately one-third of an acceptable exposure level for the given compound). The hazard quotient is considered additive only for compounds that have the same or similar toxic endpoint and the sum is referred to as the hazard index. For example, the hazard quotient for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage.

Tables 2 through 10 summarize the cancer and noncancer risks for the 14 contaminants of concern in soil, listed in Table 1, for each of the possible site scenarios evaluated to reflect present and potential future commercial or residential reuse. Based on this summary, the majority of the cancer risk is due to soil ingestion. All 14 contaminants of concern contribute to this risk. There is no significant risk from the construction worker scenario for all zones. The hazard index for all zones and all exposure scenarios was less than the target number of 1.

As a separate document, a report entitled *Addendum to Human Health Evaluation* (WESTON, July 1996) was prepared. This evaluated the risks to children (age 1 to 8 years) and youths (age 7 to 17 years) as trespassers onto areas of the site remediated to commercial cleanup levels. The results of this evaluation showed that for exposure to soils (oral and dermal exposure), the total hazard index for both children and youths was less than the target number of 1. The total cancer risk for children and youths was within the EPA acceptable risk range.

B. Ecological Risks from Site Soils

As part of RI evaluations of the MTL facility, an assessment of risks to ecological receptors at the installation was conducted. The results of this assessment are presented in a report entitled ***Baseline Risk Assessment—Environmental Evaluation*** (Life Systems, Inc., December 1993). As part of the ecological RA, it was determined that terrestrial populations and communities in the area of the installation were not of ecological concern. For this reason, the only exposure endpoints evaluated were fish inhabiting the Charles River, and migratory birds visiting the river on a transient basis.

After the MTL site was added to the NPL, at the request of EPA, the issue of risks posed to terrestrial populations at the facility was revisited, and a *Terrestrial Ecological Risk Assessment* (WESTON, 1995) that complies with the substantive requirements of CERCLA was produced. This evaluation characterized risk to terrestrial wildlife, terrestrial vegetation, and soil invertebrates posed by MTL soil contaminants. Most of the MTL site has limited potential as ecological habitat. Suitable habitat for terrestrial vegetation and wildlife is restricted to the

Table 2

Summary of Chemical Cancer Risks—Zone 1 Resident

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Cancer Risk
Resident Adult	Zone 1	Soil (not excavated)	Ingestion Dermal	7E-06 7E-06
	River Park	Soil	Ingestion Dermal	1E-05 1E-06
	Charles River	Surface Water	Ingestion Dermal	1E-10 8E-09
		Sediment	Ingestion Dermal	2E-06 5E-09
		Fish	Ingestion	5E-08
	Zone 4—Open Area	Soil	Ingestion Dermal	4E-06 3E-06
			Total Site Risk:	3E-05
Resident Adult	Zone 1	Soil (excavated)	Ingestion Dermal	6E-06 6E-06
	River Park	Soil	Ingestion Dermal	1E-05 1E-06
	Charles River	Surface Water	Ingestion Dermal	1E-10 8E-09
		Sediment	Ingestion Dermal	2E-06 5E-09
		Fish	Ingestion	5E-08
	Zone 4—Open Area	Soil	Ingestion Dermal	4E-06 3E-06
			Total Site Risk:	3E-05

Table 3

Summary of Chemical Cancer Risks—Zone 2 and 3 Resident

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Cancer Risk
Resident Adult	Zone 2	Soil (not excavated)	Ingestion Dermal	4E-05 6E-06
	River Park	Soil	Ingestion Dermal	1E-05 1E-06
	Charles River	Surface Water	Ingestion Dermal	1E-10 8E-09
		Sediment	Ingestion Dermal	2E-06 5E-09
		Fish	Ingestion	5E-08
	Zone 4—Open Area	Soil	Ingestion Dermal	4E-06 3E-06
			Total Site Risk:	7E-05
Resident Adult	Zone 3	Soil (not excavated)	Ingestion Dermal	5E-05 6E-06
	River Park	Soil	Ingestion Dermal	1E-05 1E-06
	Charles River	Surface Water	Ingestion Dermal	1E-10 8E-09
		Sediment	Ingestion Dermal	2E-06 5E-09
		Fish	Ingestion	5E-08
	Zone 4—Open Area	Soil	Ingestion Dermal	4E-06 3E-06
			Total Site Risk:	8E-05

Table 4

Summary of Chemical Cancer Risks—Zone 4 Resident

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Cancer Risk
Resident Adult	Zone 4	Soil (excavated)	Ingestion Dermal	2E-05 6E-06
	River Park	Soil	Ingestion Dermal	1E-05 1E-06
	Charles River	Surface Water	Ingestion Dermal	1E-10 8E-09
		Sediment	Ingestion Dermal	2E-06 5E-09
		Fish	Ingestion	5E-08
			Total Site Risk:	4E-05

Table 5

Summary of Chemical Cancer Risks—Worker Populations

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Cancer Risk
Commercial Worker	Zone 1	Soil	Ingestion	3E-06
	Zone 2	Soil	Ingestion	1E-05
	Zone 3	Soil	Ingestion	2E-05
Construction Worker	Zone 1	Soil	Ingestion	6E-08
		Dust	Inhalation	9E-07
			Total Risk:	1E-06
	Zone 4	Soil	Ingestion	2E-07
		Dust	Inhalation	9E-07
			Total Risk:	1E-06

Table 6

Summary of Chemical Cancer Risks—Park Visitors

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Cancer Risk
Resident Adult	River Park	Soil	Ingestion Dermal	1E-05 1E-06
	Charles River	Surface Water	Ingestion Dermal	1E-10 8E-09
		Sediment	Ingestion Dermal	2E-06 5E-09
		Fish	Ingestion	5E-08
			Total Risk:	1E-05
Resident Adult	Zone 4—Open Area	Soil	Ingestion Dermal	4E-06 3E-06
			Total Risk:	7E-06

Table 7

Summary of Hazard Indices—Zone 1 Resident

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Subchronic Hazard Index	Chronic Hazard Index
Resident Child	Zone 1	Soil (not excavated)	Ingestion Dermal	5E-02 1E-02	5E-02 1E-02
	River Park	Soil	Ingestion Dermal	3E-02 4E-03	2E-02 4E-03
	Charles River	Surface Water	Ingestion Dermal	4E-06 1E-04	3E-05 1E-03
		Sediment	Ingestion Dermal	1E-03 9E-04	2E-03 1E-02
		Fish	Ingestion	—	1E-02
	Zone 4—Open Area	Soil	Ingestion Dermal	7E-02 2E-02	4E-02 2E-02
			Total Site Hazard Index:	2E-01	2E-01
Resident Child	Zone 1	Soil (excavated)	Ingestion Dermal	5E-02 9E-03	4E-02 1E-02
	River Park	Soil	Ingestion Dermal	3E-02 4E-03	2E-02 4E-03
	Charles River	Surface Water	Ingestion Dermal	4E-06 1E-04	3E-05 1E-03
		Sediment	Ingestion Dermal	1E-03 9E-04	2E-03 1E-02
		Fish	Ingestion	—	1E-02
	Zone 4—Open Area	Soil	Ingestion Dermal	7E-02 2E-02	4E-02 2E-02
			Total Site Hazard Index:	2E-01	2E-01

Table 8

Summary of Hazard Indices—Zone 2 and 3 Resident

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Subchronic Hazard Index	Chronic Hazard Index
Resident Child		Soil (not excavated)	Ingestion Dermal	2E-01 3E-02	2E-01 4E-02
	River Park	Soil	Ingestion Dermal	3E-02 4E-03	2E-02 4E-03
	Charles River	Surface Water	Ingestion Dermal	4E-06 1E-04	3E-05 1E-03
		Sediment	Ingestion Dermal	1E-03 9E-04	2E-03 1E-02
		Fish	Ingestion	—	1E-02
	Zone 4—Open Area	Soil	Ingestion Dermal	7E-02 2E-02	4E-02 2E-02
			Total Site Hazard Index:	4E-01	3E-01
Resident Child	Zone 3	Soil (not excavated)	Ingestion Dermal	1E-01 2E-02	1E-01 6E-02
	River Park	Soil	Ingestion Dermal	3E-02 4E-03	2E-02 4E-03
	Charles River	Surface Water	Ingestion Dermal	4E-06 1E-04	3E-05 1E-03
		Sediment	Ingestion Dermal	1E-03 9E-04	2E-03 1E-02
		Fish	Ingestion	—	1E-02
	Zone 4—Open Area	Soil	Ingestion Dermal	7E-02 2E-02	4E-02 2E-02
			Total Site Hazard Index:	2E-01	3E-01

Table 9

Summary of Hazard Indices—Zone 4 Resident

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Subchronic Hazard Index	Chronic Hazard Index
Resident Child	Zone 4	Soil (excavated)	Ingestion Dermal	2E-01 2E-02	1E-01 3E-02
	River Park	Soil	Ingestion Dermal	3E-02 4E-03	2E-02 4E-03
	Charles River	Surface Water	Ingestion Dermal	4E-06 1E-04	3E-05 1E-03
		Sediment	Ingestion Dermal	1E-03 9E-04	2E-03 1E-02
		Fish	Ingestion	—	1E-02
			Total Site Hazard Index:	2E-01	2E-01

Table 10

Summary of Hazard Indices—Worker Populations

Potentially Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Hazard Index*
Commercial Worker	Zone 1	Soil	Ingestion	7E-03
	Zone 2	Soil	Ingestion	3E-02
	Zone 3	Soil	Ingestion	2E-02
Construction Worker	Zone 1	Soil Dust	Ingestion Inhalation	4E-03 —
			Total:	4E-03
	Zone 4	Soil Dust	Ingestion Inhalation	1E-02 2E-04
			Total:	1E-02

*Hazard index is subchronic for the construction worker and chronic for the commercial worker.

southeastern corner of the site. This area of the site, which includes Zone 4 and River Park, was the focus of the terrestrial ecological RA. The terrestrial species evaluated and their relevant exposure pathways are as follows:

- Short-tailed shrew:
  - Ingestion of soil invertebrates (e.g., earthworms).
  - Incidental ingestion of soil.
- White-footed mouse:
  - Ingestion of vegetation (e.g., seeds).
  - Incidental ingestion of soil.
- American robin:
  - Ingestion of soil invertebrates (e.g., earthworms).
  - Incidental ingestion of soil.
- Song sparrow:
  - Ingestion of vegetation (e.g., seeds).
  - Incidental ingestion of soil.
- Terrestrial plants:
  - Direct contact with soil.
  - Absorption/concentration from soil.
- Soil invertebrates:
  - Direct contact with soil.
  - Absorption/concentration from soil.

The potential risk posed to ecological receptors (i.e., shrew, mouse, robin, and sparrow) was assessed by comparing estimated daily doses to reference toxicity values. This comparison, described as a hazard quotient, was calculated for each contaminant by dividing the estimated daily dose by the reference toxicity values. Hazard quotients were summed across all exposure pathways for each contaminant, by receptor, to develop chemical-specific hazard indices. Hazard quotients and hazard indices were not calculated for plants and soil invertebrates. Instead, available toxicity data were presented and compared directly to soil chemical data.

The hazard indices for all ecological receptors are presented in Section 5 of the *Terrestrial Ecological Risk Assessment* (WESTON, June 1995). The hazard quotients and hazard indices for ecological receptors were calculated using two exposure concentrations: the mean and the 95% upper confidence limit (UCL) of the mean.

A hazard index of < 1 indicates that adverse effects are not likely to occur, and no action is required. A hazard index of > 10 indicates that risks are at a level of potential concern, and may warrant action, depending on the nature of the risk, the nature of the site and surrounding

properties, evaluations of background levels of contaminants in the area under investigation, and uncertainties associated with the risk calculation.

A hazard index between 1 and 10 is subject to interpretation based on the toxicity of the chemical and the uncertainty in the calculation. In addition, the frequency of detection and reproducibility of the data should be investigated. Whether a remedial action must be initiated should be examined on a site-by-site basis, after careful consideration of the levels of the hazard indices compared to the possible adverse impacts of remedial action on the ecological habitat (e.g., loss of existing wetland communities and other habitats, or increased contaminant migration resulting from resuspension of contaminated fine-grained particles). The only receptors whose exposure to soil contaminants at MTL would result in hazard indices exceeding 10 are the shrew, white-footed mouse, and robin.

An overview of the findings of the ecological RA and the contaminants that contributed substantially to the total hazard for each receptor is as follows:

- Northern short-tailed shrew—Based on the mean soil exposure concentrations, chemical-specific hazard indices that exceeded 10 were chlordane (12), chromium (22), nickel (360), and zinc (13). Based on the 95% UCL exposure concentrations, chlordane (41), DDT (46), arsenic (13), chromium (24), lead (37), nickel (430), and zinc (15) result in exceedances of a hazard index of 10. Approximately 87% to 93% of the hazard indices can be attributed to the earthworm ingestion exposure route.

- White-footed mouse—Nickel was the only contaminant that exceeded a hazard index of 10 for the mouse. The hazard indices calculated for nickel were 16 and 19, based on the mean and the 95% UCL exposure concentrations, respectively. Seed ingestion contributed the majority of the risk (>70%).

- American robin—The exposure route that contributed the most risk to the robin was the earthworm ingestion route (>95%). Within this pathway, pesticides contributed the largest portion of the risk (86% for mean exposure concentrations; 96% for the UCL). Based on the mean soil exposure concentrations, hazard indices that exceeded 10 were DDE (40) and DDT (48). Based on the 95% UCL exposure concentrations, hazard indices that exceeded 10 were DDE (180), DDT (280), and endrin (16).

- Song sparrow—No chemical-specific hazard indices exceeded 10 for the song sparrow. Only two hazard indices exceeded 1 (DDT—2.2 and endrin—1.9), based on the 95% UCL exposure concentrations.

A comparison of soil concentrations at the site with phytotoxicity data shows the potential for phytotoxic effects to occur at some locations on-site. Exceedances of phytotoxicity data occurred for arsenic, cadmium, copper, lead, and zinc. These metals occurred on-site at concentrations that have been shown to cause yield reductions, growth retardation, leaf discoloration, and reduced germination.

Potential effects on soil invertebrates also may occur at some locations at the site. Exceedances of toxicity data were observed for chlordane, DDE, copper, and zinc. The maximum detected concentrations of copper and zinc at the site exceed the LC_{50} (the lethal concentration for 50% of the test organisms) for earthworms, and a number of other locations exceeded the EC_{50} (the effective concentration for 50% of the test organisms) for cocoon production in earthworms.

Chlordane exceeded concentrations at which sperm count depressions have been observed in earthworms, and DDE exceeded concentrations at which epidermal changes have been observed in earthworms.

The presence of hazardous substances in soil at this operable unit, if not addressed by implementing the remedial action selected in this Record of Decision, may present an unacceptable risk to human health and the environment. Remedial actions were developed to address the risks associated with site soils.

VIII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Remedial Action Objectives

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including the following:

- A requirement that the remedial action, when complete, comply with all federal and more stringent state environmental standards, requirements, criteria, or limitations, unless a waiver is invoked.

- A requirement that a remedial action be selected that is cost-effective and that uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

- A preference for remedies in which treatment that permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substances is a principal element over remedies not involving such treatment.

Remedial alternatives were developed to be consistent with these Congressional mandates.

Based on information from the RI relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to aid in the development and screening of alternatives. These remedial action objectives were developed to mitigate existing and future potential threats to human health and the environment. At this site, for this operable unit, one remedial action objective was identified. This objective was to mitigate the risks to human health and the environment posed by direct contact with and incidental ingestion of contaminated soils.

B. Technology and Alternative Development and Screening

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives was developed for the site.

With respect to soil contamination, the RI/FS developed a range of alternatives in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances is a principal element. This range of alternatives included the following:

- An alternative that removes or destroys hazardous substances to the maximum extent feasible, eliminating or minimizing to the degree possible the need for long-term management.

- Alternatives that treat the principal threats posed by the site, but vary in the degree of treatment used and the quantities and characteristics of the treatment residuals and untreated waste that must be managed.

- Alternative(s) that involve little or no treatment but provide protection through engineering or institutional controls.

- A no-action alternative.

As discussed in Section 3 of the FS, the RI/FS identified, assessed, and screened technologies based on implementability, effectiveness, and cost. These technologies were combined into alternatives for soil remediation. Section 4 of the FS presented the remedial alternatives developed by combining the technologies identified in the previous screening process in the categories identified in Section 300.430(e)(3) of the NCP. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated and screened in Section 4 of the FS.

In summary, of the six soil remedial alternatives screened in Section 4 of the FS, all six were retained for detailed analysis. Table 11 identifies the six alternatives that were retained through the screening process.

Table 11

Alternatives for Remediation of Soil

Alternative S1—No Action • No remedial actions implemented at the site.
Alternative S2—Institutional Controls • Access restrictions to prevent entry into contaminated areas. • Deed restrictions to restrict site development. • Five-year site reviews to assess conditions.
Alternative S3—Capping of Soils • Institutional controls. • Five-year site reviews to assess conditions. • Construction of asphalt cap over contaminated soils. • Use of runon/runoff controls during cap placement. • Continued monitoring of cap and repair of cap as necessary.
Alternative S4—Soil Excavation and Thermal Treatment • Excavation of soil contaminated at levels greater than action levels. • Transportation of soil to: - Option A—On-site incinerator. - Option B—Off-site incinerator. - Option C—On-site low-temperature thermal desorber. • Backfilling of site with uncontaminated soil (Option B) or treated soil (Options A and C).
Alternative S5—Soil Excavation and On-Site Physical/Chemical Treatment • Excavation of soil contaminated at levels greater than action levels. • On-site treatment of contaminated soil by: - Option A—Chemical oxidation. - Option B—Solvent extraction. • Treatment or disposal of treatment residues. • Backfilling of site with treated soil.
Alternative S6—Soil Excavation and Off-Site Disposal or Reuse (Selected Remedy) • Excavation of soil contaminated at levels greater than action levels. • Transportation of soil for off-site recycling or to a hazardous or nonhazardous landfill. • Backfilling of site with uncontaminated soil.

IX. DESCRIPTION OF ALTERNATIVES

This section provides a narrative summary of each alternative evaluated. A detailed tabular assessment of each alternative is presented in Table 6-1 of the FS.

In the FS, all alternatives were analyzed and costs determined for the three possible site reuse scenarios (as developed previously by the Watertown Arsenal Reuse Committee's approved MTL Reuse Plan). These scenarios are defined fully in Section 3 of the FS. The scenario defined as Reuse Scenario 3 is consistent with the Town of Watertown's intended future use of MTL as outlined in the Reuse Plan. The Reuse Plan was developed by the Arsenal Reuse Committee and approved by the Watertown Town Council. This reuse scenario is defined as a mixture of commercial and residential reuse for developed areas (commercial reuse for Zones 1 and 2 and residential reuse for Zone 3) and public access for undeveloped areas (Zone 4 and the River Park). This reuse scenario was used in establishing specific soil cleanup goals in each zone and determining the soil areas to be remediated. The approximate locations of areas requiring soil remediation are shown in Figure 4. An estimated total soil volume of 23,600 yd^3 will require remediation. This represents an increase in soil volume of approximately 800 yd^3 from the Proposed Plan. Cost estimates for the alternatives below have been adjusted accordingly to reflect the change in soil volume. See Section XIII for further description of soil volume and cost changes.

The following alternatives were evaluated (the designation "S" indicates that these alternatives refer to soil):

Alternative S1—No Action: This alternative was evaluated in detail in the FS to serve as a baseline for comparison with the other remedial alternatives under consideration. Under this alternative, no active or passive treatment or containment of contaminated areas would occur. The only activity would be an EPA-required site review every 5 years.

Estimated Time for Design and Construction: None.
Estimated Time of Operation: Indefinitely.
Estimated Capital Cost: None.
Estimated Operation and Maintenance Cost (30-year net present worth): $27,400.
Estimated Total Cost (30-year net present worth): $27,400.

Alternative S2—Institutional Controls: Under this alternative, no treatment or containment of contaminated areas would occur. The only effort that would be made to restrict potential exposure to site contaminants would be through the use of institutional controls, such as installing warning signs and fences around contaminated areas and imposing deed restrictions on site real estate transfer.

Estimated Time for Design and Construction: 6 months.
Estimated Time of Operation: Indefinitely.
Estimated Capital Cost: $12,000.
Estimated Operations and Maintenance Cost (30-year net present worth): $166,600.
Estimated Total Cost (30-year net present worth): $178,600.

Alternative S3—Capping of Soils: Alternative S3 would not involve removal of the contaminated soil. Instead, the contaminated areas would be covered with a permanent asphalt cap. The cap, which would prevent contact with the contaminated soil, would require long-term maintenance.

Estimated Time for Design and Construction: 32 months.
Estimated Time of Operation: Indefinitely.
Estimated Capital Cost: $2,868,000.
Estimated Operation and Maintenance Cost (30-year net present worth): $2,388,000.

Estimated Total Cost (30-year net present worth): $5,256,000.

Alternative S4—Option A: Soil Excavation and Treatment Using On-Site Incineration: In this alternative, all soil exceeding cleanup criteria would be excavated. Excavated material would be stockpiled on-site until treatment. Treatment would be conducted using an on-site mobile incinerator. Prior to full-scale operation, trial burns would be conducted to determine incinerator operating conditions. Air emission controls would be implemented. Treatment ash would be analyzed and disposed of on- or off-site depending on its characteristics. Any metals-contaminated soil requiring remediation would be excavated and disposed of off-site. Clean soil would be used to backfill the excavations.

Estimated Time for Design and Construction: 36 months.
Estimated Time of Operation: 12 to 18 months.
Estimated Capital Cost: $13,627,000.
Estimated Operation and Maintenance Cost (30-year net present worth): $27,000.
Estimated Total Cost (30-year net present worth): $13,654,000.

Alternative S4—Option B: Soil Excavation and Treatment Using Off-Site Incineration: In this alternative, all soil exceeding cleanup criteria would be excavated. Excavated material would be stockpiled on-site. Soil would be transported to an off-site incinerator for treatment. Treatment ash would be disposed of at the off-site facility. Any metals-contaminated soil requiring remediation would be excavated and disposed of off-site. Clean soil would be used to backfill the excavations.

Estimated Time for Design and Construction: 27 months.
Estimated Time of Operation: 9 to 12 months.
Estimated Capital Cost: $51,033,000.
Estimated Operation and Maintenance Cost (30-year net present worth): $27,000.
Estimated Total Cost (30-year net present worth): $51,060,000.

Alternative S4—Option C: Soil Excavation and Treatment Using On-Site Thermal Desorption: In this alternative, all soil exceeding cleanup criteria would be excavated. Excavated material would be stockpiled on-site until treatment. Treatment would be conducted using an on-site mobile thermal desorber. Prior to full-scale operation, a trial system operation would be performed to determine proper operating conditions. Removed contaminants would be collected and disposed of off-site or treated on-site. The treated soil would be used to backfill the excavations. Any metals-contaminated soil requiring remediation would be excavated and disposed of off-site.

Estimated Time for Design and Construction: 36 months.
Estimated Time of Operation: 12 to 18 months.
Estimated Capital Cost: $17,500,000.
Estimated Operation and Maintenance Cost (30-year net present worth): $27,000.
Estimated Total Cost (30-year net present worth): $17,527,000.

Alternative S5—Option A: Soil Excavation and Treatment Using On-Site Chemical Oxidation: In this alternative, all soil exceeding cleanup criteria would be excavated. Excavated material would be stockpiled on-site until treatment. During treatment, the soil would be mixed with water and a chemical oxidizing agent. Organic contaminants would be destroyed in a chemical reaction. No treatment residuals would remain. The treated soil would be used as on-site backfill in the excavations. Any metals-contaminated soil requiring remediation would be excavated and disposed of off-site. Prior to full-scale operation, a bench-scale test would be performed to determine the required dosage of oxidant.

Estimated Time for Design and Construction: 24 months.
Estimated Time of Operation: 6 to 8 months.
Estimated Capital Cost: $5,556,000.
Estimated Operations and Maintenance Cost (30-year net present worth): $27,000.
Estimated Total Cost (30-year net present worth): $5,583,000.

Alternative S5—Option B: Soil Excavation and Treatment Using On-Site Solvent Extraction: This alternative involves an on-site physical separation treatment called solvent extraction. In this alternative, all soil exceeding cleanup criteria would be excavated. Excavated material would be stockpiled on-site until treatment. During treatment, the contaminants in the soil would be removed by mixing the soil with a nontoxic solvent. Contaminants would be dissolved from the soil into the solvent. The solvent would be collected and the contaminants recovered from the solvent. The solvent would be recycled, and recovered contaminants would be disposed of off-site or treated on-site. The treated soil would be used to backfill the excavations. Any metals-contaminated soil requiring remediation would be excavated and disposed of off-site.

Estimated Time for Design and Construction: 30 months.
Estimated Time of Operation: 9 to 12 months.
Estimated Capital Cost: $11,828,000.
Estimated Operation and Maintenance Cost (30-year net present worth): $27,000.
Estimated Total Cost (30-year net present worth): $11,855,000.

Alternative S6—Soil Excavation and Off-Site Disposal/Reuse: In this alternative, all soil exceeding cleanup criteria would be excavated. Excavated material would be divided into hazardous and nonhazardous waste. All excavated soil would be disposed of off-site. Hazardous soil would be disposed of at a hazardous waste landfill. Nonhazardous waste would be disposed of at a nonhazardous landfill and/or an asphalt batching facility. The excavations would be backfilled with clean soil.

Estimated Time for Design and Construction: 6 months.
Estimated Time of Operation: 6 to 9 months.
Estimated Capital Cost: $5,741,000.
Estimated Operation and Maintenance Cost (30-year net present worth): $27,000.
Estimated Total Cost (30-year net present worth): $5,768,000.

X. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that at a minimum are required to be considered in the assessment of alternatives. Building on these specific statutory mandates, the NCP presents nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed alternative analysis using the nine evaluation criteria was performed to select a site remedy. This section presents a summary of the comparison of each alternative's strengths and weaknesses with respect to the nine evaluation criteria.

A. Summary of Evaluation Criteria

The criteria are summarized as follows:

Threshold Criteria—The following two threshold criteria must be met for alternatives to be eligible for selection in accordance with the NCP:

1. **Overall protection of human health and the environment** addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether a remedy will meet all of the ARARs of other federal and state environmental laws and/or will provide grounds for invoking a waiver.

Primary Balancing Criteria—Once an alternative satisfies the threshold criteria, the following five criteria are used to compare and evaluate the elements of the alternatives:

3. **Long-term effectiveness and permanence** addresses the criteria that are used to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

4. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives use recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.

5. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital, operation and maintenance (O&M), and present-worth costs.

Modifying Criteria—The modifying criteria are used in the final evaluation of remedial alternatives generally after the lead agency has received public comment on the RI/FS and Proposed Plan:

8. **State acceptance** addresses the state's position and key concerns related to the selected remedy and other alternatives, and the state's comments on ARARs or the proposed use of waivers.

9. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS.

A detailed assessment of each alternative according to the nine criteria is presented in Table 12.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted. This comparative analysis is included in Section 6 of the FS.

B. Discussion of Alternatives

The following subsections present the nine criteria and brief narrative summaries of the alternatives and the strengths and weaknesses according to the detailed comparative analysis.

Overall Protection of Human Health and the Environment—Successful application of Alternatives S4 (Options A, B, and C); S5 (Options A and B); and S6 would provide the highest level of overall protection by preventing direct contact with and ingestion of contaminants in site soil. Under these alternatives, the soil contaminants would be removed and treated on-site, treated off-site, or disposed of off-site. Alternative S4—Options A and C and Alternative S5—Options A and B would require treatability testing and/or pilot testing to determine whether cleanup goals would be achieved.

Alternative S3 also provides protection, but at a lesser level than Alternatives S4 through S6. Under Alternative S3, protection is provided by a cap, which would prevent direct contact with contaminated soil; however, contaminants would remain in-place, and protection would depend on continued cap maintenance. Under Alternative S2, protection of human health would be achieved through certain measures already taken to prevent people from coming into direct contact with and possible ingestion of contaminated materials at the site, provided such measures are maintained and/or improved. However, risks to the environment would not be controlled through such security measures, therefore, Alternative S2 would provide a minimal level of overall protection. Alternative S1 provides no level of overall protection.

Compliance with ARARs—There are no chemical-specific ARARs for this site because there are no promulgated soil cleanup standards. All of the alternatives meet the location- and action-specific ARARs (if applicable).

Long-Term Effectiveness and Permanence—Successful application of Alternatives S4 (Options A, B, and C); S5 (Options A and B); and S6 provides a similar degree of long-term effectiveness and permanence because all material that results in unacceptable risk based on intended use is removed and either treated on-site or taken off-site for treatment or disposal. Alternative S3, which isolates contaminants beneath a cap, provides a lesser degree of effectiveness and permanence, because effective containment of contaminants depends on continued cap

Table 12

Comparison of Soil Alternatives

Criteria	Alternative S1 No Action	Alternative S2 Institutional Controls	Alternative S3 Capping of Soils	Alternative S4 Option A Treatment Using On-Site Incineration	Alternative S4 Option B Treatment Using Off-Site Incineration	Alternative S4 Option C Treatment Using Thermal Desorption	Alternative S5 Option A Treatment Using Chemical Oxidation	Alternative S5 Option B Treatment Using Solvent Extraction	Alternative S6 Off-Site Disposal or Reuse
Overall Protection of Human Health and the Environment									
• Protectiveness	Would fail to achieve remedial action objectives for contaminated soils.	Would fail to achieve remedial action objectives for contaminated soils.	Would protect human health and the environment by preventing direct human receptor contact with risk-based soils.	Would protect human health and the environment by permanently destroying all soil contaminants.	Would protect human health and the environment by permanently destroying all soil contaminants.	Would protect human health and the environment by permanently removing contaminants from site soil.	Would protect human health and the environment by permanently destroying contaminants in site soils.	Would protect human health and the environment by extracting contaminants from soils.	Would protect human health and the environment by removing contaminated soils from the site and disposing of them in an approved landfill.
Compliance with ARARs									
• Chemical-Specific	None.	None.	None.	None.	None.	None.	None.	None.	None.
• Location-Specific	Not applicable.	Would meet location-specific ARARs.	Would meet location-specific ARARs.	Would meet location-specific ARARs.	Would meet location-specific ARARs.	Would meet location-specific ARARs.	Would meet location-specific ARARs.	Would meet location-specific ARARs.	Would meet location-specific ARARs.
• Action-Specific	Not applicable.	Not applicable.	Would meet action-specific ARARs.	Would meet action-specific ARARs.	Would meet action-specific ARARs.	Would meet action-specific ARARs.	Would meet action-specific ARARs.	Would meet action-specific ARARs.	Would meet action-specific ARARs.

Table 12

Comparison of Soil Alternatives
(Continued)

Criteria	Alternative S1 No Action	Alternative S2 Institutional Controls	Alternative S3 Capping of Soils	Alternative S4 Option A Treatment Using On-Site Incineration	Alternative S4 Option B Treatment Using Off-Site Incineration	Alternative S4 Option C Treatment Using Thermal Desorption	Alternative S5 Option A Treatment Using Chemical Oxidation	Alternative S5 Option B Treatment Using Solvent Extraction	Alternative S6 Off-Site Disposal or Reuse
Long-Term Effectiveness									
• Adequacy and Reliability of Controls	Not applicable.	Not adequate to meet remedial action objectives for contaminated soils.	Asphalt cap would require a long-term maintenance commitment and institutional controls.	Soil contaminants would be destroyed by incineration, thereby eliminating the need for long-term controls.	Soil contaminants would be destroyed by incineration, thereby eliminating the need for long-term controls.	Soil contaminants would be removed and treated separately, thereby eliminating the need for long-term controls.	Soil contaminants would be destroyed by chemical oxidation, thereby eliminating the need for long-term controls.	Soil contaminants would be extracted, thereby eliminating the need for long-term controls.	Contaminated soils would be removed from the site; however, disposed of soils would have to be managed in a landfill indefinitely.
• Magnitude of Residual Risk	Risk not reduced.	No reduction in risk to ecological receptors.	Residual risk would be minimized as long as cap is properly maintained.	Risk would be reduced to background levels of contaminants (within NCP acceptable levels).	Risk would be reduced to background levels of contaminants (within NCP acceptable levels).	Risk would be reduced to background levels of contaminants (within NCP acceptable levels).	Risk would be reduced to background levels of contaminants (within NCP acceptable levels).	Risk would be reduced to background levels of contaminants (within NCP acceptable levels).	Risk would be reduced to background levels of contaminants (within NCP acceptable levels).
Reduction of Toxicity, Mobility, and Volume of Contaminants Through Treatment									
• Treatment Process Used and Materials Treated	Not applicable.	Not applicable.	An asphalt cap would provide a physical barrier preventing direct human receptor contact with risk-based contaminated soils.	Incineration would permanently remove contaminants of concern by thermal destruction.	Incineration would permanently remove contaminants of concern by thermal destruction.	Thermal desorption would permanently remove contaminants from site soil to be treated or destroyed separately.	Chemical oxidation would permanently destroy soil contaminants.	Solvent extraction would permanently remove soil contaminants and subsequently treat them.	Excavation and off-site disposal would not treat or destroy contaminants but would limit their mobility.

Table 12

Comparison of Soil Alternatives
(Continued)

Criteria	Alternative S1 No Action	Alternative S2 Institutional Controls	Alternative S3 Capping of Soils	Alternative S4 Option A Treatment Using On-Site Incineration	Alternative S4 Option B Treatment Using Off-Site Incineration	Alternative S4 Option C Treatment Using Thermal Desorption	Alternative S5 Option A Treatment Using Chemical Oxidation	Alternative S5 Option B Treatment Using Solvent Extraction	Alternative S6 Off-Site Disposal or Reuse
• Amount of Hazardous Materials Treated or Destroyed	None.	None.	None.	All soil contaminants of concern would be destroyed.	All soil contaminants of concern will be destroyed.	Soil contaminants of concern would be removed and treated or disposed of.	Soil contaminants would be permanently destroyed.	Soil contaminants would be extracted from soil and treated.	None. Contaminated soils would not be treated but would be contained.
• Degree of Expected Reduction in Toxicity, Mobility, and Volume	None.	None.	None.	Toxicity, mobility, and volume of contaminants would be virtually eliminated.	Toxicity, mobility, and volume of contaminants will be virtually eliminated.	Toxicity, mobility, and volume of contaminants would be virtually eliminated.	Toxicity, mobility, and volume of contaminants would be significantly reduced.	Toxicity, mobility, and volume of contaminants would be significantly reduced through removal of contaminants from site soil.	Only the mobility of contaminants would be significantly reduced.
• Degree of Irreversibility	Not applicable.	Not applicable.	Completely reversible.	Irreversible.	Irreversible.	Irreversible.	Irreversible.	Irreversible.	Irreversible.
• Type and Quantity of Residuals Remaining	All soil contaminants would remain.	All soil contaminants would remain.	All soil contaminants would remain.	No residual contamination expected to remain.	No residual contamination expected to remain.	No residual contamination expected to remain.	No residual contamination expected to remain.	No residual contamination expected to remain.	No residual contamination expected to remain.

Table 12

Comparison of Soil Alternatives
(Continued)

Criteria	Alternative S1 No Action	Alternative S2 Institutional Controls	Alternative S3 Capping of Soils	Alternative S4 Option A Treatment Using On-Site Incineration	Alternative S4 Option B Treatment Using Off-Site Incineration	Alternative S4 Option C Treatment Using Thermal Desorption	Alternative S5 Option A Treatment Using Chemical Oxidation	Alternative S5 Option B Treatment Using Solvent Extraction	Alternative S6 Off-Site Disposal or Reuse
Short-Term Effectiveness									
• Protection of Community During Implementation	Not applicable.	Institutional controls would restrict direct contact with soils.	Erosion and sedimentation as well as dust controls would be implemented during paving operations.	Erosion and sedimentation as well as dust controls would be implemented during excavation. Heavy truck traffic would result.	Erosion and sedimentation as well as dust controls would be implemented during excavation. Heavy truck traffic would result.	Erosion and sedimentation as well as dust controls would be implemented during excavation.	Erosion and sedimentation as well as dust controls would be implemented during excavation.	Erosion and sedimentation as well as dust controls would be implemented during excavation.	Erosion and sedimentation as well as dust controls would be implemented during excavation. Heavy truck traffic would result.
• Protection of Workers	Not applicable.	Not applicable.	Workers would be adequately protected during construction.	Workers would be adequately protected during soil remediation.	Workers would be adequately protected during soil remediation.	Workers would be adequately protected during soil remediation.	Workers would be adequately protected during soil remediation.	Workers would be adequately protected during soil remediation.	Workers would be adequately protected during soil remediation.
Implementability									
• Ability to Construct and Operate the Technology	Not applicable.	Not applicable.	Asphalt capping uses ordinary paving techniques.	Mobile incinerators are widely used and easily constructed and operated. Test burns would be required.	Off-site incinerators exist and are easily accessed.	Thermal desorption units are commercially available and easily operated. Pilot tests would be required.	Mobile chemical oxidation units can be easily installed and operated.	Solvent extraction units are commercially available and easily installed and operated.	Excavation and off-site disposal can be easily implemented through regular excavation activities.
• Ease of Site Preparation	Not applicable.	Not applicable.	Easily performed.	No site preparation needed.	No site preparation needed.	No site preparation needed.	No site preparation needed.	No site preparation needed.	No site preparation needed.

Table 12

Comparison of Soil Alternatives
(Continued)

Criteria	Alternative S1 No Action	Alternative S2 Institutional Controls	Alternative S3 Capping of Soils	Alternative S4 Option A Treatment Using On-Site Incineration	Alternative S4 Option B Treatment Using Off-Site Incineration	Alternative S4 Option C Treatment Using Thermal Desorption	Alternative S5 Option A Treatment Using Chemical Oxidation	Alternative S5 Option B Treatment Using Solvent Extraction	Alternative S6 Off-Site Disposa or Reuse
• Ease of Undertaking Additional Remedial Actions	Not applicable.	Not applicable.	Would not interfere with any additional remedial actions.	Would not interfere with any additional remedial actions.	Would not interfere with any additional remedial actions.	Would not interfere with any additional remedial actions.	Would not interfere with any additional remedial actions.	Would not interfere with any additional remedial actions.	Would not interfer with any additiona remedial actions.
• Ability to Monitor Effectiveness	Not applicable.	Not applicable.	Cap would be periodically inspected for signs of deterioration and damage.	Treated soils and site excavations would be tested to ensure that treatment standards are met.	Treated soils and site excavations would be tested to ensure that treatment standards are met.	Treated soils and site excavations would be tested to ensure that treatment standards are met.	Treated soils and site excavations would be tested to ensure that treatment standards are met.	Treated soils and site excavations would be tested to ensure that treatment standards are met.	Confirmatory sampling would ensure complete removal of contaminated soil.
• Ability to Obtain Approval from Other Agencies	Not applicable.	Deed restrictions should not be difficult to obtain.	Approval from the state may be difficult to obtain.	Approval not needed.	Approval not needed.	Approval not needed.	Approval not needed.	Approval not needed.	Approval by a landfill may be difficult to obtain.
• Availability of Materials	Not applicable.	Materials for security measures are readily available.	Materials are readily available.	Materials are readily available.	Materials are readily available.	Materials are readily available.	Materials are readily available.	Materials are readily available.	Materials are readily available.
• Availability of Unusual or Special Services	Not applicable.	Not applicable.	Not needed.	Readily available.	Readily available.	Readily available.	Readily available.	Readily available.	Not needed.
Cost									
• 30-Year Net Present Worth	$27,400	$178,600	$5,256,000	$13,654,000	$51,060,000	$17,527,000	$5,383,000	$11,855,000	$5,768,000

Table 12

Comparison of Soil Alternatives
(Continued)

Criteria	Alternative S1 No Action	Alternative S2 Institutional Controls	Alternative S3 Capping of Soils	Alternative S4 Option A Treatment Using On-Site Incineration	Alternative S4 Option B Treatment Using Off-Site Incineration	Alternative S4 Option C Treatment Using Thermal Desorption	Alternative S5 Option A Treatment Using Chemical Oxidation	Alternative S5 Option B Treatment Using Solvent Extraction	Alternative S6 Off-Site Disposal or Reuse
State Acceptance	Not considered to be acceptable. Does not represent a permanent solution.	Not considered to be acceptable. Does not represent a permanent solution.	Not considered to be acceptable. Does not represent a permanent solution.	Is considered to be acceptable. Represents a permanent solution.	Is considered to be acceptable. Represents a permanent solution.	Is considered to be acceptable. Represents a permanent solution.	Is considered to be acceptable. Represents a permanent solution.	Is considered to be acceptable. Represents a permanent solution.	Is considered to be acceptable. Represents a permanent solution.
Community Acceptance	Not considered to be acceptable.	Not considered to be acceptable.	Not considered to be acceptable.	Not considered to be acceptable.	Considered to be acceptable.	Considered to be acceptable.	Considered to be acceptable.	Considered to be acceptable.	Considered to be acceptable.

maintenance. Alternatives S1 and S2 are the least effective and permanent of all alternatives evaluated because contaminants remain in-place. For Alternative S2, exposure is controlled only through continued implementation of security measures at the site. There is no level of controlling exposure for Alternative S1.

Reduction of Toxicity, Mobility, or Volume Through Treatment—Only Alternatives S4 and S5 reduce toxicity, mobility, or volume to some extent, as these are the only alternatives that involve treatment. Successful application of Alternative S4—Options A and B and Alternative S5—Option A would provide the greatest level of reduction because they involve destruction of site contaminants. Alternative S4—Option C and Alternative S5—Option B provide a lesser degree of reduction because contaminants would be separated from the soil and require additional treatment or disposal. Alternatives S1, S2, S3, and S6 do not meet this criterion because they do not include treatment. Alternatives S3 and S6 reduce contaminant mobility although no treatment is performed. Alternatives S1 and S2 do not reduce contaminant mobility.

Short-Term Effectiveness—All of the alternatives retained for detailed analysis in the FS would be effective in the short term. Alternatives S1 and S2 would not have significant short-term impacts because no active remedial measures would be taken. However, because of the potential for release of contaminants during the excavation activities under Alternatives S3 through S6, special engineering precautions would be taken to minimize the potential for contaminant emissions to ensure short-term protection of workers and area residents during cleanup-related construction activities. Some risk may be imposed on the community because of heavy truck traffic around the site. This would be required for Alternatives S3 through S6 to mobilize for excavation activities; Alternative S4—Options A and C and Alternative S5—Options A and B to transport on-site treatment equipment to the site; and Alternatives S3, and S4—Option B, and S6 to transport contaminated soil from the site. Impacts from truck traffic can be minimized by using only truck routes for transportation.

Prior to implementation of an alternative, the Army estimates that the time to complete documents required by the FFA between the Army and EPA and to complete the procurement process will be approximately 18 to 24 months. This time frame has been included for each alternative in the Estimated Time for Construction and Design in Section IX of this Record of Decision. This time frame would not be required for Alternatives S1, S2, or S6. There would be no such requirements for the no action alternative. For Alternatives S2 and S6, this time frame is approximately 3 months and has been included in the Estimated Time for Construction and Design in Section IX.

Under Alternative S1, protection would not likely achieve any level of protectiveness in the short-term. For Alternative S2, an additional 3 months would be required to achieve protection. For Alternative S3, an additional 7 to 10 months is expected to achieve protection. Alternatives S4 and S5 would both require design work and/or bench- and pilot-scale testing. After this work is completed, implementation of Alternative S4 is expected to require 12 to 18 months. Alternative S5 is expected to take approximately 6 to 8 months to implement. Protection is expected to be achieved for Alternative S6 in approximately 9 months after completion of procurement.

Implementability—All the options of Alternative S4 may be time consuming to implement as a result of the trial burns and/or scheduling delays. Alternative S5—Option A is implementable and has been used successfully at other sites. This option would require a proprietary reagent that is available through only one vendor. Prior to implementation, treatability tests on the oxidation technology would be conducted to verify that the soil cleanup goals can be achieved in a cost-

effective manner. Alternative S5—Option B could require multiple pilot studies to establish the best specific solvent to use; there are several proprietary solvent extraction systems that use different solvents. Alternative S6 is proven and can be implemented without requiring treatability testing. Implementation could be lengthy because of the volume of soil and waste that would have to be shipped to a hazardous waste and/or nonhazardous waste disposal facility. Delays in transportation for disposal could be possible. Alternatives S1 and S2 do not have significant implementation issues because no active remedial measures would be taken.

Cost—The capital, O&M, and total costs (present worth) for each alternative are included in Section IX. For alternatives involving removal and treatment/disposal of contaminated soil, Alternative S5—Option A and Alternative S6 are the most cost effective with total costs nearly equal for these two options. The next most cost effective is Alternative S5—Option B, the costs of which are more than twice that of Alternatives S5—Option A and S6. The least cost effective is Alternative S4—Option B, the costs of which are nearly 10 times those of Alternatives S5—Option A and S6.

State Acceptance—MADEP has been involved with this site since the beginning of closure activities and has reviewed the RI/FS and Proposed Plan. MADEP prefers that a permanent solution be selected if the aspects of the other eight criteria are relatively equal. The selected remedy represents a permanent solution, and MADEP concurs with the selection of Alternative S6.

Community Acceptance—In general, the community has supported the conclusions of the RI/FS and the alternatives presented in the Proposed Plan. The RAB co-chair, the technical advisor to the Watertown Citizens for Environmental Safety (recipient of the EPA Technical Assistance Grant), and other members of the community expressed their support, during the public comment period, of the Army's intended remedial action. In addition, some members of the community expressed a desire to remediate the entire site to residential standards, rather than the mixed commercial and residential site reuse, which is consistent with the intended reuse of the site as outlined in the Town-approved Arsenal Reuse Plan.

XI. THE SELECTED REMEDY

The selected remedy is soil excavation and off-site disposal/reuse (Alternative S6). This remedy is described in Section IX. This remedy is comprehensive for site soils.

A. Soil Cleanup Levels

Using the information gathered during the RI/FS, remedial action objectives were identified for cleanup . MTL site. The cleanup objective for this site is to minimize the risks to human health and the environment posed by direct contact with and incidental ingestion of contaminated soils.

To meet this objective, site-specific cleanup levels were established that will be protective of human health and the environment. These levels were established by calculating risk-based cleanup goals to comply with the requirements of CERCLA as well as MCP requirements, as discussed in Section VII.

For human health, risk-based goals for 14 different compounds detected in soil were determined. With the exception of one compound, the risk-based goals were all lower than local background concentrations so that the actual cleanup goals for these compounds are background levels. The MCP and CERCLA do not require remediation to below background levels. Background concentrations were determined using soil data collected from numerous points off-site from the MTL property and from points near or along the northern property boundary (Arsenal Street).

An EPA-approved statistical evaluation of the background soil data set was used to calculate the 90% UCL. The UCL calculated for each contaminant was used as the contaminant's background level, and hence as the MTL site cleanup goal. For more detail on the statistical evaluation, refer to Section 2 of the FS. The compounds for which specific cleanup goals have been set for the MTL site for human health include six pesticides, seven SVOCs, and one PCB. The one compound for which the background level was not appropriate was the PCB Aroclor-1260. The cleanup goal for Aroclor-1260 is based on the EPA-issued cleanup guidance for PCBs at Superfund sites.

For ecological risk, separate cleanup goals were determined for the undeveloped areas of the site for 6 pesticides, 11 SVOCs, 1 PCB, and 8 metals. The derived ecological goals for SVOCs and the PCB were greater than those cleanup goals established for human health, and/or the ecological cleanup goals exceeded concentrations detected on-site. Hence, these goals were not used because the greater risk from these contaminants is to human health. The metals cleanup goals were not included in the remediation plan, as discussed in Section VII, because on-site metals concentrations are generally consistent with normal background levels. Any areas with metals contamination posing an unacceptable localized risk will be handled in the site remediation. For pesticides, instead of applying the cleanup goals sitewide, specific locations with unacceptable ecological risk were identified and included in the remediation plan. These areas will be remediated to the ecological cleanup goals for pesticides.

To be consistent with the site RAs, cleanup goals were determined for each site zone. The individual zone cleanup goals are summarized in Table 13. In the table, a "—" listed as the cleanup goal for a chemical indicates that the chemical was not a contaminant of concern for that

Table 13

MTL Site Soil Cleanup Goals*

Chemical	Zone 1 Commercial Reuse (mg/kg)	Zone 2 Commercial Reuse (mg/kg)	Zone 3 Residential Reuse (mg/kg)	Zone 4 Public Access (mg/kg)	River Park (mg/kg)
Benzo(a)anthracene	–	8.5	8.5	8.5	8.5
Benzo(a)pyrene	–	2.0	2.0	2.0	2.0
Benzo(b)fluoranthene	–	7.9	7.9	7.9	7.9
Benzo(k)fluoranthene	–	6.2	6.2	6.2	6.2
Chlordane	–	–	1.5	1.4	1.4
Chrysene	–	–	11.1	11.1	11.1
4,4'-DDD	–	–	–	13.7	13.7
4,4'-DDE	–	–	–	1.4E-01	1.4E-01
4,4'-DDT	–	–	–	1.7E-01	1.7E-01
Dibenz(a,h)anthracene	–	–	2.7E-01	–	2.7E-01
Dieldrin	–	–	–	3.5E-01	3.5E-01
Heptachlor epoxide	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	3.0	3.0	3.0	3.0
Aroclor-1260	–	–	1.0	1.0	–

*The cleanup goals correspond to soil background concentrations, with the exception of Aroclor-1260, which is based on EPA guidance. Pesticide cleanup goals for Zone 4 Public Access and River Park are based on ecological risk.

particular zone. The soil cleanup goals do not differ for the different future uses (i.e., commercial or residential) because background concentrations are used to set the cleanup goals. The future use scenario does determine which contaminants are to be remediated in the different zones because the RAs based on commercial and residential reuse yielded different contaminants of concern.

The locations of soil areas to be remediated are shown in Figure 4. The approximate depth of soil requiring remediation is 3 ft bgs. The cleanup goals will be achieved within the excavations.

B. Description of Components of Selected Remedy

The selected remedy for soil remediation consists of excavation and off-site disposal or reuse of contaminated soil. This remedy includes the following:

- Excavation of areas with contaminated soils that are above cleanup goals.
- Confirmatory soil sampling within excavations after contaminated soil removal.
- Off-site landfill disposal or reuse of the excavated soil.
- Backfilling of clean fill soils into the excavations.
- Institutional controls with 5-year site reviews.

For this remedy, all soil exceeding cleanup criteria would be excavated. All excavated areas would be sampled to ensure that cleanup goals are met. Excavated material would be divided into hazardous and nonhazardous waste. Prior to off-site transport, excavated soil would be staged and covered to prevent contaminant migration and to protect the stockpiles from wind and rain. All excavated soil would be disposed of off-site. Hazardous soil would be disposed of at a hazardous waste landfill. Nonhazardous waste would be disposed of at a nonhazardous landfill and/or asphalt batching facility. The excavations would be backfilled with clean soil. This remedy would not require any treatability testing. This remedy would require substantial trucking for both contaminated soil removal and import of clean soil. Trucking activities will be coordinated by the Army in conjunction with the Town of Watertown and other pertinent officials to ensure that proper truck routes are used and optimal trucking operation hours established to minimize any traffic disruption for the community.

Institutional controls for this site would be deed restrictions, which will be necessary only in the areas slated for commercial reuse where the level of cleanup is not as stringent as for areas remediated to residential use or public use as well as for contaminated soil underneath buildings that will not be remediated. The deed restrictions would prevent the use of areas remediated to commercial reuse levels for uses other than commercial. The restrictions also would not allow the demolition of buildings under which soil contamination above cleanup goals was detected without proper handling of any contaminated soils (i.e., excavation and disposal). To the extent required by law, EPA and the Army will review the site at least once every 5 years after the initiation of remedial action at the site for the areas where any hazardous contaminants remain to ensure that the deed restrictions continue to protect human health and the environment. Specifically, the reviews will be performed to determine if deed restrictions are effective and that land use has not changed.

XII. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the MTL site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost effective. The selected remedy does not satisfy the statutory preference for treatment that permanently and significantly reduces the mobility, toxicity, or volume of hazardous substances as a principal element. The selected remedy uses resource recovery technologies to the maximum extent practicable.

A. The Selected Remedy Is Protective of Human Health and the Environment

The selected remedy at this site will permanently reduce the risks posed to human health and the environment by eliminating, reducing, or controlling exposures to human and ecological receptors through soil excavation and off-site disposal/reuse. Institutional controls will be used for any soil areas not remediated to residential reuse cleanup levels. Deed restrictions, as discussed earlier, will be placed on the property at the time of transfer.

Moreover, the selected remedy will achieve a maximum level of protection of human health and environment for the intended future site reuse to the extent allowable by CERCLA and the NCP. The site soil cleanup goals to be achieved are background levels (with the exception of PCBs, which are based on EPA guidance).

B. The Selected Remedy Attains ARARs

This remedy will attain all applicable or relevant and appropriate federal and state requirements that apply to the site. The principal environmental laws from which ARARs are derived and the specific ARARs include:

- Resource Conservation and Recovery Act.
- Clean Air Act.
- Federal Protection of Floodplains Executive Order.
- National Historic Preservation Act.
- Archaeological and Historic Preservation Act.
- Massachusetts Hazardous Waste Management.
- Massachusetts Solid Waste Management.
- Massachusetts Air Pollution Control.
- Massachusetts Historical Commission Regulations.

The following policies, criteria, and guidances are to be considered (TBC) criteria for implementation of the remedial action:

- EPA Risk Reference Doses.
- EPA Carcinogen Assessment Group Potency Factors.
- Guidance on Remedial Actions for Superfund Sites with PCB Contamination.
- Test Methods for Evaluating Solid Waste and Physical/Chemical Methods.
- Massachusetts Policy on Allowable Sound Emissions.

A tabular summary of the ARARs and TBCs for the selected remedy is included in Appendix D.

C. The Selected Remedy Is Cost Effective

The selected remedy is cost effective, i.e., the remedy affords overall effectiveness proportional to the costs. In selecting the remedy, once the Army identified alternatives that are protective of human health and the environment and that attain, or, as appropriate, waive ARARs, the Army evaluated the overall effectiveness of each alternative by assessing the relevant three criteria—long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. The costs of the selected remedy are:

- Estimated Time for Design and Construction: 6 months.
- Estimated Time of Operation: 6 to 9 months.
- Estimated Capital Cost: $5,741,000.
- Estimated Operation and Maintenance Cost (30-year net present worth): $27,000.
- Estimated Total Cost (net present worth): $5,768,000.

In evaluating the remedial alternatives, for those alternatives that achieved the maximum extent of overall protection of human health and the environment, the selected remedy had the lowest costs to achieve the same results.

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

Once the Army identified those alternatives that attain or, as appropriate, waive ARARs and are protective of human health and the environment, the Army identified the alternatives that use permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: 1) long-term effectiveness and permanence; 2) reduction of toxicity, mobility, or volume through treatment; 3) short-term effectiveness; 4) implementability; and 5) cost. The balancing test *emphasized* long-term effectiveness and permanence and the reduction of toxicity, mobility, and volume through treatment, and *considered* the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance.

The selected remedy provides the best balance of trade-offs among the alternatives. When compared to other alternatives that provide an equal level of overall protection as the selected remedy (Alternatives S4 through S6), the selected remedy is similar to the other alternatives in relation to short-term effectiveness, long-term effectiveness, and the attainment of ARARs. With regard to reduction of volume, mobility, and toxicity of the contaminants, the selected remedy does not meet this criterion as no treatment is included; however, this remedy includes reuse of the excavated soil to the maximum extent possible for a nontreatment remedy (i.e., nonhazardous soil is reused). Alternative S4—Options A and B and Alternative S5—Option A provide the highest level of reduction because the contaminants are destroyed. Alternative S4—Option C and Alternative S5—Option B provide a lesser level of reduction because the contaminants are separated from the soil but would require further treatment.

In terms of implementability, all these alternatives, except the selected remedy and Alternative S4—Option B, would require some form of bench-scale treatability testing and/or pilot-scale tests. All these alternatives would require the same implementation procedures for soil excavation and staging. The selected remedy and Alternative S4—Option B are the most easily implemented because they require only the off-site transportation of excavated soil for treatment or disposal.

For the remaining on-site treatment alternatives, Alternative S5—Option A is the most easily implemented because this remedy requires the least amount of treatability testing and because its on-site treatment system is the simplest to construct and operate. This results in shorter mobilization duration and a lower frequency of potential equipment failure causing temporary system shutdown. However, all alternatives that require treatability studies have the potential risk of not being able to achieve the desired cleanup goals. This is especially true for the more innovative soil treatment approaches of Alternative S5—Options A and B.

The selected remedy also is cost effective for the alternatives that can achieve overall protection of human health and the environment. The present-worth cost of the selected remedy ($5,768,000) is almost the same as the most cost-effective alternative, which is Alternative S5—Option A ($5,583,000). Present-worth costs of the remaining alternatives range from $11,855,000 for Alternative S5—Option B to $51,060,000 for Alternative S4—Option B.

In selecting the selected remedy, the factors that were the most determinative in the decision were implementability and cost-effectiveness. The selected remedy provided the lowest overall remediation cost, while also being the easiest and quickest to implement. Whereas similar remediation costs could be achieved for Alternative S5—Option A, this alternative could not be implemented as quickly as the selected remedy. Also, treatability tests for the alternative could have concluded that the remediation technology could not have achieved the desired goals, or could not have done so in a more cost-effective manner than the selected alternative. Both the state and the community concur with the selected remedy.

While the selected remedy does not achieve a reduction of toxicity, mobility, or volume of contaminants through treatment, this factor is outweighed by the level of the cost-effectiveness and implementability the selected remedy affords. In addition, the state and community support this remedy.

E. The Selected Remedy Does Not Satisfy the Preference for Treatment That Permanently and Significantly Reduces the Toxicity, Mobility, or Volume of the Hazardous Substances as a Principal Element

The statutory preference for treatment as a principal element is not satisfied by the selected remedy, because this remedy results in off-site disposal/reuse of contaminated soil. The fact that the selected remedy does not meet this statutory preference did not exclude this alternative from selection because there were no other equally cost-effective and easily implemented alternatives that could achieve the maximum extent of overall protection of human health and the environment. The selected remedy will result in reduction in mobility of contaminants through soil reuse in a landfill or through immobilization as reuse in asphalt batching.

XIII. DOCUMENTATION OF SIGNIFICANT CHANGES

The Army presented a Proposed Plan (preferred and contingency alternatives) for remediation of the site on April 16, 1996. The preferred alternative (Alternative S5—Option A) presented at that time included:

- Excavation of areas with contaminated soils that are above cleanup goals. The excavated soils would be stockpiled on-site until treatment. Stockpiles would be managed to prevent contaminated soil migration.
- Treatment of the excavated soil on-site using chemical oxidation.
- Backfilling of the treated soils into the excavations.
- Institutional controls with 5-year site reviews.

The contingency alternative was Alternative S6 (the selected remedy in this Record of Decision) and included:

- Excavation of areas with contaminated soils that are above cleanup goals.
- Off-site landfill disposal or reuse of excavated soil.
- Backfilling of clean fill soil into the excavations.
- Institutional controls with 5-year site reviews.

There are three significant changes from the Proposed Plan in this Record of Decision:

1. The Army has changed the recommended alternative for selection from the preferred alternative in the Proposed Plan (Alternative S5—Option A) to the selected remedy (Alternative S6). The change in remedy selection was due to two factors; cost of remediation for Alternative S6 and the Town of Watertown's desire for a more expedited remediation schedule.

Subsequent to the release of the Proposed Plan, as part of the predesign effort, soil samples were collected from the specific areas that require remediation. Toxicity Characteristic Leaching Procedure (TCLP) analysis was performed on these samples to determine if excavated soils from remediation would be classified as a Resource Conservation and Recovery Act (RCRA) and state hazardous waste. The results of this testing indicated that only samples from Area M (Yacht Club) would be a characteristic hazardous waste based on lead. Based on the testing results, all remaining soil to be excavated is considered nonhazardous for disposal purposes.

This new information has resulted in a substantial change in the estimated cost of the off-site disposal/reuse alternative. The original estimate assumed 50% of the excavated soil would be classified as hazardous waste. A new cost estimate has been prepared assuming all soil, except Area M would be disposed of as nonhazardous waste. Keeping all other cost estimate assumptions the same as the original estimate, the cost of implementing the selected remedy has been reduced to approximately $5,741,000 (from the original $10,700,000). The selected remedy cost estimates in Sections IX and XII in this Record of Decision have been revised from the Proposed Plan to account for this soil classification data. More specific information on the analytical data and the new cost estimate is provided in Appendix C.4 and in the Administrative Record.

A meeting was held on August 8, 1996 to explain this information to members of the public. As a result of the change in remediation cost for the selected remedy, members of the community have requested that the Army implement the selected remedy. In a letter dated August 14, 1996 from the Arsenal Reuse Committee, a request was made to implement the selected remedy because this would allow the soil remediation to be completed 1 year in advance of the original schedule for implementation of Alternative S5—Option A. This would allow for optimal economic redevelopment potential of the site for the town. The transcript of the August 8, 1996 meeting and public comment letters received are included in Appendix C.4.

2. The second change affects the amount of soil to be remediated. Based on several public comments to have the entire site remediated to residential levels instead of the mixed commercial and residential reuse identified in the Reuse Plan, the Army has decided to increase the level of remediation in two areas of concern in Zone 2 from commercial cleanup goals to residential cleanup goals. These two areas are shown in Figure 4 as Areas F and T.

Area F was previously identified as an area of concern for commercial cleanup; under this Record of Decision, this area will be remediated to residential cleanup goals. Although this does not change the estimated soil remediation volume for this area, the number of contaminants of concern in this area is increased from four to 11.

Area T is an area that was not included for remediation in the Proposed Plan because no contaminants in this area exceeded the commercial cleanup goals. However, for the residential reuse scenario, this was an area of concern. This area was previously delineated in the FS for site residential reuse as Area H (see Figure 3-2 of the FS). Adding this area to the total remediation volume will result in an estimated increase in soil volume of 800 yd^3. This also results in an increase in the cost estimate for remediation. The remediation alternative cost estimates and the selected remedy cost estimates in Sections IX and XII in this Record of Decision have been revised from the Proposed Plan to account for this increase in soil volume.

3. The third change refers to a change in the Accelerated Action for Area I/Building 131 vicinity and Area M (Yacht Club Tank Area) as discussed in the Proposed Plan. This Accelerated Action was to involve the separate remediation of Areas I and M as shown in Figure 4. The Area I accelerated action was deemed necessary to facilitate an anticipated transfer of Building 131 to the Massachusetts College of Professional Psychology in the spring of 1997. At the same time, the Yacht Club requested that the soil at Area M be remediated early to allow them to replace a UST used to store fuel for their boats. These two actions were included in the Proposed Plan as the Accelerated Action.

The Accelerated Action could result in a slight overall increase in site remediation cost to the Army. Because of the replacement of the UST, the Army Materiel Command Legal Office requested that Area M be deleted from the Accelerated Action and be included in the overall remedial action. Therefore, the Record of Decision signed on June 28, 1996 for the Accelerated Action included Area I only. The remediation of Area M is included under this Record of Decision.

XIV. STATE ROLE

MADEP has reviewed the various alternatives and has indicated its support for the selected remedy. The state also has reviewed the RI/FS (including the RA) to determine whether the selected remedy is in compliance with applicable or relevant and appropriate state environmental laws and regulations. MADEP concurs with the selected remedy for the MTL site. A copy of the Declaration of Concurrence is included in Appendix B.

US. Army Materials Technology Lab
Watertown, Ma
Administrative Record

DOC. #	DESCRIPTION	AUTHOR	DATE
	FACTUAL INFORMATION		
1.	Preliminary Assessment Site Inspection	E G&G Idaho Inc	3/88
2.	Technical Plans for USAMTL Remedial Investigation and Feasibility Study	E G&G Idaho Inc	5/88
3.	USAMTL Remedial Investigation (Volume I and II)	E G&G Idaho Inc	9/89
4.	Final Phase II Remedial Investigation Report (Volume I through III)	Roy F. Weston	12/93
5.	Final Phase II Remedial Investigation Report (Volume I through V)	Roy F. Weston	5/94
6.	Baseline Risk Assessment Environmental Evaluation	Roy F. Weston	12/93
7.	Final Terrestrial Risk Assessment	Roy F. Weston	8/95
8.	Final Feasibility Study Report (Outdoor) (Volume I and II)	Roy F. Weston	1/96
9.	Draft Addendum to Human Health Evaluation	Roy F. Weston	2/96
10.	Feasibility Study for Base Closure RI/FS Responsiveness Summary	Roy F. Weston	11/95
11.	Feasibility Study for Base Closure RI/FS Responsiveness Summary	Roy F. Weston	1/96
12.	Final Proposed Plan	Roy F. Weston	4/96
13.	Draft Final Proposed Plan for Base Closure Responsiveness Summary	Roy F. Weston	4/96
14.	USAMTL Remedial Investigation Responsiveness Summary	Roy F. Weston	4/93
15.	Phase II Remedial Investigation Comments	NONE	MISC.
16.	Terrestrial Ecological Risk Assessment Comments	NONE	MISC.
17.	Terrestrial Ecological Risk Assessment Response to Comments	Roy F. Weston	6/95
18.	Feasibility Study Comments	NONE	MISC.
19.	Proposed Plan Comments	NONE	MISC.
20.	Community Comments on Residential vs. Commercial Cleanup Standards	NONE	MISC.
21.	Phase I Remedial Investigation Report	Roy F. Weston	4/91
22.	Community Environmental Response Facilitation Act Report	Environ. Res. Mgt.	4/94
23.	Final Hazard Ranking Package for AMTL	Halliburton Nus	4/93
24.	Federal Facilities Agreement	EPA/Army	5/95
25.	Phase 1 RI Comments	NONE	MISC.
26.	Army Regulation 200-1, Environment Protection and Enhancement, and 200-2, Environmental Effects of Army Actions	Army Army	5/90, & 12/88

DOC. #	DESCRIPTION	AUTHOR	DATE
PUBLIC PARTICIPATION			
27.	BRAC Cleanup Plan Guidebook	Dept. of Defense	10/93
28.	Base Realignment and Closure Plan Version I	Earthtech	3/94
29.	Base Realignment and Closure Plan Version II	Earthtech	3/95
30.	Comments on BCP	NONE	MISC.
31.	Media Coverage	NONE	MISC.
32.	Site Tour Handouts	NONE	6/94
33.	Site Tour Handouts	NONE	10/94
34.	Site Tour Handouts	NONE	6/95
35.	Site Tour/Information Session Handouts	Army	1/96
36.	Information Session- Outdoor Remediation	Army	4/96
37.	Community Relations Mailing List	Army	MISC.
38.	Restoration Advisory Board Meeting Dates	Army	MISC.
39.	Project Team Meeting Dates	Army	MISC.
40.	Public Involvement and Response Plan	Roy F. Weston	2/92
41.	Community Relations Plan	Roy F. Weston	5/95
42.	LTC Blose's Brief to Reuse Committee	Army	4/96
43.	Public Hearing Proposed Plan Transcript and Comments	Army	5/96
OTHER INFORMATION			
44.	Trustee Notification Letters	Army	7/94
45.	Watertown Arsenal Reuse and Feasibility Study (Town Reuse Plan)	Goody-Clancy	11/93
46.	EIS for Disposal and Reuse	Jaycor	9/95
47.	Public Health Assessment for MTL	ATSDR	2/96
48.	Health Consultation for MTL	ATSDR	3/96
49.	Guidance List	None	N/A
50.	OSWER Directive 9355.7-04 Land Use in the CERCLA Remedy Process	EPA	5/95
51.	Technical Memorandum for Area 1	Army	6/96

APPENDIX B:

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION DECLARATION OF CONCURRENCE

~~To Be Provided~~

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON MA 02108 (617) 292-5500

WILLIAM F. WELD
Governor

ARGEO PAUL CELLUCCI
Lt. Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

September 20, 1996

Linda Murphy
Director, Waste Management Division
U.S. Environmental Protection Agency
Region I, JFK Building
Boston, MA 02203-2211

RE: Army Materials Technology Laboratory; Watertown, MA
Soil and Groundwater Operable Unit

Dear Ms. Murphy:

The Massachusetts Department of Environmental Protection (Department) has reviewed the September 18, 1996 Record of Decision (ROD) regarding the Soil and Groundwater Operable Unit. The Department has reviewed the Army's selection of off-site disposal (the back-up remedy contained in the Proposed Plan) as the selected remedial action for its consistency with Massachusetts General Law Chapter 21E and the Massachusetts Contingency Plan. Based upon this review, the Department concurs with the selected remedial action. The selected remedial action will be protective of human health, welfare, and the environment for the Soil and Groundwater OU areas. Additionally, the selected remedial action will meet state ARARs, provide the Watertown community with a timely transfer of the AMTL property, and will be cost effective.

The selected remedial action will have the following components:

1) Excavation of contaminated soils;
2) Characterization of soil contaminants to determine appropriate disposal methods;
3) Transportation of soils off-site for recycling, reuse, or disposal;
4) Backfilling of remediated areas with clean soil;

Based on evaluation of information gathered during remedial investigations, no groundwater remediation is required.

The Town of Watertown's request for the use of the Proposed Plan's contingency remedy as the selected remedy was based on its need for the earliest possible transfer of AMTL property and the Army's updated cost estimates for off-site disposal of contaminated soils. The transportation routes for the disposal of contaminated soils will be based on

Town input and all other applicable regulations. The cleanup plan for the site is consistent with the local reuse plan and will require the implementation of institutional controls for those areas that are not available for unrestricted future use.

The Department looks forward to working with EPA and the Army in this common endeavor and we are pleased to assist in the transfer of Army property in a manner that is protective of human health, welfare, and the environment. If you have any questions please feel free to contact me at (617) 292-5648.

Very truly yours,

James C. Colman

James C. Colman
Assistant Commissioner

cc: Mr. Steven Ward, Watertown Board of Health
Mr. John Airasian, Chairman Watertown Reuse Committee
Honorable Warren Tolman, State Senator
Honorable Rachel Kaprielian, State Representative
Mr. Matt O'Neill, Office of the Honorable Joseph P. Kennedy II
Ms. Megan Cassidy, Environmental Protection Agency
Mr. Robert Chase, AMSRL-OP-RK-WT
Mr. Steve Johnson, DEP BWSC - NERO

PUBLIC COMMENTS AND RESPONSIVENESS SUMMARY

APPENDIX C.1

COMMENT RESPONSIVENESS SUMMARY

APPENDIX C.1

COMMENT RESPONSIVENESS SUMMARY

Comments were received from the public both during the 30-day public comment period and during the formal public hearing on the Proposed Plan. Comment letters are presented in Appendix C.2. The transcript of the public hearing is included as Appendix C.3. There were four main concerns voiced in the comments received. They are summarized as follows.

1. **Comment:** Three commentors supported the Proposed Plan with the addition of residential cleanup standards applied to Areas F and T as mentioned by Lieutenant Colonel Todd Blose in a meeting with the Watertown Reuse Committee on April 29, 1996.

   Response: While this comment does not require a response, it should be noted that the two areas were added after the issuance of the Proposed Plan. The areas will be included in the list of Significant Changes in the Record of Decision.

2. **Comment:** Five commentors did not agree that the proposed cleanup standards based on mixed reuse were protective of human health and wanted all of the soil to be remediated to residential standards.

   Response: We disagreed with their conclusion. The cleanup standards were based on the proposed reuse of the facility as set by the Town's Reuse Plan. These standards have been reviewed by the Army's Center for Health Promotion and Preventive Medicine, who have determined that they are protective of human health based on the proposed mixed reuse of the facility. The Massachusetts Department of Environmental Protection (MADEP) and the U.S. Environmental Protection Agency (EPA) Region I are reviewing the Army's proposal for cleanup. They must concur with the final cleanup standard that will be provided in the Record of Decision. Their preliminary comments on the FS and Proposed Plan are that for the proposed mixed reuse of the facility, the proposed remediation will be protective of human health.

3. **Comment:** The commentors also stated that additional housing is needed in the town and that the proposed cleanup for mixed reuse would not allow the town to use the property for residential housing.

   Response: The Army was not involved in the development of the Reuse Plan. It was developed and approved solely by the town. The town has indicated to the Army that it would like the property to be transferred under an economic development conveyance to allow for commercial development. We would like to note that the town's Reuse Plan examined the feasibility of converting the existing structures into residential housing. With the exception of Building 39, all of the buildings cited as being suitable for residential housing are now included in areas being cleaned up to residential standards.

   The imposition of reuse restrictions does not prevent the town from redeveloping the property for residential use in the future. At that time, the town or developer could petition MADEP and EPA to remove the restrictions.

4. **Comment:** A comment was raised that because of the town's past experience with redeveloping previously excessed Army property, remediating to all residential standards would provide a level of increased comfort to the citizens.

Response: We believe that this would be a misappropriation of taxpayer dollars to do additional cleanup solely to increase citizens' "comfort." The cleanup is based on independently validated stan[illegible] protection of human health and the environment. We believe that if this [illegible]s accurately communicated, citizens will feel comfortable with the proposed site cleanup.

One commentor (Rich Rago, Restoration Advisory Board) provided the following three specific comments to the final Proposed Plan:

5. **Comment:** Page 6, Section 2: Have the 14 ppm chlorinated solvents that were detected in the well been confirmed to be from an off-site source? This concentration appears too high for such a suggestion.

Response: The monitor well that contained the 14 ppm concentration of chlorinated solvents was MW-23. This well is located upgradient of MTL north of Arsenal Street. This well is not located on the installation. Contamination in this well is from an off-site source(s). Please refer to the RI and/or FS for more information on groundwater characterization.

6. **Comment:** Page 8, Paragraph 1-4: Does the text infer that the soil risk assessments do not address future use scenarios? Have exposure pathways been considered for the site construction worker or utility worker? It is inevitable that these activities will occur in the future.

Does the text infer that a GW-2 scenario is, in no case, appropriate for some of the site groundwater? Has the migration of vapors into site buildings been assessed? I am concerned that an earlier lack of attention to site groundwater will be a later problem.

Response: In accordance with EPA and MADEP risk assessment requirements, all applicable potential future use exposure pathways were assessed. The soil risk assessment assessed exposures for future residents, commercial workers, construction and utility workers, and public park visitors. Please refer to the RI/FS for a complete discussion on the risk assessment.

MADEP has classified the groundwater at the MTL site as a GW-3. MADEP has made this classification because the site groundwater does not meet the Massachusetts Contingency Plan definition for either a GW-1 or GW-2 aquifer. MADEP has determined that migration of vapors from groundwater into building basements is not an appropriate exposure scenario based on the groundwater characterization.

7. **Comment:** Page 9, Paragraph 1-2: Is it reasonable to say that there is a "background concentration" of pesticides? I understand that PAHs have been associated with urban fills and certain other soils. It would appear that the appropriate background concentration for pesticides would be "ND."

Response: Determining a background concentration for pesticides is considered appropriate for this site. No mission operations at MTL involved pesticides; pesticides were used only for weed and insect control. Pesticides were detected in the background samples collected in Watertown, indicating a widespread usage of pesticide products in the area for similar reasons as their usage

at MTL. Since part of the regulatory definition of background is contaminant concentrations that would be present in the absence of the site, it is clear that pesticides would still be present in the absence of the MTL site. EPA and MADEP concur with this position.

Concern was also expressed about health issues of past MTL workers and long-time Watertown residents near the MTL site. In response to this concern, the U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry prepared a health assessment for the MTL property. This report was completed on March 29, 1996. A copy of the report is located in the MTL Administrative Record located at the installation and at the Watertown Free Public Library.

Additionally, public comments were received relating to requests for information on the radiation decontamination of MTL. Information and documents on radiological decontamination for MTL can be found at the installation and at the Watertown Free Public Library. Also, for more information on this issue, please contact Dennis Waskiewicz at the following address:

U.S. Army Corps of Engineers
New England District
424 Trapelo Road
Waltham, MA 02254-9149

APPENDIX C.2

WRITTEN PUBLIC COMMENT LETTERS
(MAY 13, 1996)

Town Council

TOWN OF WATERTOWN

ADMINISTRATION BUILDING • WATERTOWN, MA 02172

(617) 972-6470 • FAX (617) 972-6403

May 13, 1996

Todd Blose, Colonel, USA
Assistant Chief of Staff
BRAC Installation Management
600 Army Pentagon
Washington, D.C. 20310

Dear Colonel Blose:

As President of the Watertown, Massachusetts Town Council, I write to provide my views, and those of the Town Council as expressed in an unanimous resolution on February 13, 1996, regarding the cleanup and reuse of the property known as the Watertown Arsenal site.

In its unanimous resolution, the Town Council voted to request the maximum level of cleanup possible. The Arsenal site represents the last significant property in the entire community available for development or redevelopment. It is essential to the Town that it be developed in a careful and planned way to assure that it contributes to the character of the Town -- and, as appropriate to its reuse, to our tax base. Through our community's re-use committee, the Town has endorsed a mixed-use of commercial, residential and open space for the site. As President of the Town Council, however,. I share the concern of my colleagues that our principle concern must be for the health and safety of Watertown's residents, and to those who will one day soon live and work on the site.

Assuring that the site is cleaned to a higher, residential, standard is not a request to change the use of the property. Rather, it is meant to ensure that what is done is what is best for the Town of Watertown. That is why we have requested that the United States government bring the clean-up of the site to the highest standards of the United States Army.

Like others of my colleagues on the Town Council and residents generally, I am disappointed with the general response to the Town Council's resolution. It is our understanding that other bases across the country must also be cleaned, and from prior service as Assistant to the Secretary of Defense during a major base realignment, there are only so many dollars to do the job. That said,

the site before you're finished. I ask for the additional $1.5 to $5 million (your estimates) needed to complete the cleanup job to which the citizens of Watertown are entitled. This should not be treated as a frivolous request.

I believe we gave up the fight for this maximum cleanup too soon. After the Re-Use Committee letter was written making the request, I informed Congressman Kennedy, Senator Kennedy and Senator Kerry. They made inquiries and wrote letters supporting the council's resolution. I am not privy to what followed, but the Army has come back and agreed to clean up an additional two small areas designated as areas F and T. This is agreeable and would not have happened without the council resolution. We may never know what would have happened had we as town officials stood firm and united to fight for the full cleanup. A short delay would not have hurt anyone, leaving a less than clean site could hurt many.

What happens now? Your cleanup process designates different levels of clean--more clean for residential and open space and less clean for commercial. Your job is to convince us that less clean is just as safe as more clean. Technical jargon aside, I look forward to a convincing explanation. In a simple analogy which anyone could understand: If you clean your bathroom more in one corner and less in another, because you don't step into the less clean area as often, will there be less germs in the bathroom?

History has taught me to be skeptical of the cleanup process. This entire area has a murky past since the days when the Arsenal Mall went from a planning idea to a much regretted reality. There have been repeated reports and concerns about contamination found in Arsenal Park and the Charles River. The neighbors of the Arsenal area and the citizens of the town have reason to be skeptical.

In a recent issue of the Watertown Press, the Arsenal's Public Affairs Director Chuck Paone called this request for additional cleanup a "non-issue." In his letter he portrayed the cleanup more as an indulgence ignoring the fact that federal law requires all of what has been done. Don't rock the boat we are told. Cleanup is the only issue. If you don't clean it properly now, how many years will it take before we have a study showing those living, working or playing on or around the site have been exposed to a higher health risk? These are my major concerns. That is why I sponsored an increased cleanup resolution and why I am here this evening. I won't ever stop being concerned about the Watertown Arsenal site. Especially when I read about other sites around the country that were thought to be safe.

Thank you.

Sincerely,

Paul Denning
Disirict B Councillor

TOWN OF WATERTOWN

ADMINISTRATION BUILDING

WATERTOWN, MASSACHUSETTS 02172

ARSENAL REUSE COMMITTEE

May 20, 1996

Mr. Jeffrey Waugh
US Army Environmental Center, Attn: CEAEC-BC
Aberdeen Proving Ground
Aberdeen, MD 21010-5401

RE: **Proposed Plan for the Environmental Remediation of the Former US Army Arsenal-Research Laboratory, Watertown, MA**

Dear Mr. Waugh:

The Town of Watertown's Arsenal Reuse Committee has reviewed the Proposed Plan for the clean-up of the former US Army Research Laboratory.

Based upon all of the alternative methods evaluated, we concur that chemical oxidization is the safest and most thorough technique to clean contaminated soil on the site.

With regard to the level of remediation, we preferred an entirely "residential" standard for the reasons stated in our February 14 letter to Chuck Paone, Base Transition Coordinator. However, based upon Col.Dennis Cochran's response letter of March 22, and Col.Blose's meeting with our Committee on April 29, we are satisfied with the Army's plan for clean-up levels consistent with our Reuse Plan. As you know, a consensus of the Committee was achieved when Areas F&T were added to the "residential" clean-up zone.

The Committee was further made comfortable with the Plan based upon statements from the United States Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP) that following remediation, the site will be protective of human health and safe for redevelopment. Attached please find letters from those agencies documenting this position.

For the above stated reasons, we are satisfied with the Army's extensive analysis of and plan to remediate environmental issues at the facility. We are now prepared to move forward with the final planning and implementation of the economic conversion and revitalization of the property.

Thank you for your continued cooperation on this important project.

Sincerely,

John S. Airasian

John S. Airasian,
Chairman

Department of Defense policy on the role of future land use in the remedy selection process.

As stated above, EPA will evaluate and consider all comments submitted during the public comment period. Public comment is an important part of the process. Comments received will be weighed against other pertinent criteria for remedy selection before EPA provides concurrence on the final decision.

If you have any questions regarding AMTL, please contact me at 573-5785.

Sincerely,

Meghan F. Cassidy

Meghan F. Cassidy
Remedial Project Manager

cc: Bob Chase/AMTL
Jeff Waugh/Army Environmental Center
Albe Simenas/MA DEP
Dennis Waskiewicz/Army Corps of Engineers
Susan Falkoff/WCES
Jim Okun/O'Reilly, Talbot and Okun
Mary Sanderson/EPA Federal Facilities Superfund Section

JN/am/avs
Copy Furnished:

Mr. Steven Ward, Watertown Board of Health
Ms. Susan Falkoff, RAB Co-Chair, Environmental
Honorable Warren Tolman, State Senator
Honorable Rachel Kaprielian, State Representative
Mr. Matt O'Neill, Office of the Honorable Joseph P. Kennedy II
Ms. Megan Cassidy, Environmental Protection Agency
Dr. Lorna Bozeman, ATSDR
Mr. Dennis Waskiewicz, CENED-PD - L
Mr. Robert Chase, AMSRL-CP-RK-WT
Mr. Robert Hallisey, Dept. of Public Health
Mr. Jeffery Waugh, AEC Base Closure Division
Mr. Steve Johnson, DEP BWSC - NERO

MEMORANDUM

23 May 1996

TO: Jeffrey H. Waugh
Project Manager

C: Susan Falkoff

FROM: Rich Rago
Restoration Advisory Board

SUBJECT: Final Proposed Plan
Army Materials Technology Laboratory
Watertown, Massachusetts

This memorandum transmits comments on the Final Proposed Plan prepared by Roy F. Weston, Inc. for the Army Materials Technology Laboratory (MTL) property in Watertown, Massachusetts. These comments may address text of the Proposed Plan; they do not specifically address chemical oxidation.

In days past, the Arsenal was an asset to the town of Watertown. At this time, I would like to thank the United States Army for the hard work they have undertaken *after* the close of the MTL. I am confidant that the property left behind will continue to be an asset for the town. In my opinion, the Army has worked hard to understand and address the concerns of the citizens of Watertown. As a resident of Watertown and neighbor of the Arsenal property, I appreciate it very much.

Page 6, Section 2: *Has the 14 ppm chlorinated solvents that were detected in the well confirmed to be from an off-site source? This concentration appears too high for such a suggestion.*

Page 8, Par. 1-4: *Does the text infer that the soil risk assessments do not address future use scenarios? Have exposure pathways been considered for the site construction worker or utility worker? It is inevitable that these activities will occur in the future.*

Does the text infer that a GW-2 scenario is, in no case, appropriate for some of the site groundwater? Has the migration of vapors into site buildings been assessed? I am concerned that an earlier lack of attention to site groundwater will be a later problem.

Page 9, Par. 1-2: *Is it reasonable to say that there is a "background concentration" of pesticides? I understand that PAHs have been associated with urban fills and certain other soils. It would appear that the appropriate background concentration for pesticides would be "ND."*

APPENDIX C.3

TRANSCRIPT OF PROPOSED PLAN FORMAL HEARING (MAY 13, 1996)

ORIGINAL

UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY

MATERIAL TECHNOLOGY LABORATORY

In the Matter of:

PUBLIC HEARING, RE:

PROPOSED PLAN - REMEDIATION OF OUTDOOR SOILS

Armenian Cultural Center
47 Nichols Street
Watertown, Massachusetts

Monday
May 13, 1996

The above entitled matter came on for hearing, pursuant to Notice at 7:06 p.m.

PANEL MEMBERS

BEFORE: GREGORY J. MAHALL, Chairman

ROBERT CHASE, BRAC Environmental Coordinator

JEFFREY WAUGH, Army Environmental Center

I N D E X

the record and addressed accordingly.

As I said, we're here to entertain comments and concerns, questions and commendations. These will be responded to in a responsiveness summary at the end of the public comment period on this proposed plan. The comment period started on April 22nd and runs through May 22nd.

Before we begin, I'd like to introduce to you this evening, and I'm sure most of you all know, Mr. Bob Chase, the installation and environmental coordinator at the Arsenal, and Bob will get the evening's events off and running, Bob.

MR. BOB CHASE: Good evening everyone. Thank you for taking time out from your busy schedules to partake in our public hearing tonight.

As you are well aware, the hearing is to discuss or enter into the record your concerns or comments on the proposed plan for the Army Research Lab, which is part of the former Arsenal Area, the 37 acres that the Army has recently vacated.

The proposed plan is dealing with the alternative for cleaning up the outdoor soil contamination. We are proposing a Chemical Oxidation Process and that is the process which we intend to proceed with based on comments we receive tonight.

There are two areas that we are also going to do

we're trying to do it a little bit faster than the normal process.

We're going to be doing the removals there and just disposing the soil in an approved landfill or to meet the state requirements and they'd be disposed of off site, and then back filled with new, clean soil.

We said we'd begin -- the, there are basically -- we're also looking comments on the levels of clean up. We're looking at basically three levels at the Arsenal. Commercial up in this area, residential in this area, and then open space down below.

And the levels are, basically, dependant on different types of contaminants. Where, the final clean-up level is pretty much based on background with some contaminants based on the different risk levels.

Bob said we will be replying to all comments submitted tonight and in writing. And we would, this, the comments will be part of the record decision which must be approved by EPA.

EPA, the Environmental Protection Agency, and also the Massachusetts Department of Environment Protection will be reviewing all of our responses and all of your comments.

So, they will be aware of it and our responses. EPA and the State do have a role in this and EPA has to approve our plan and then the State, also, has a role in

has been entered into the public record and as responded as such.

We have a microphone here. We have a microphone there. We would appreciate it if when making your comment, you identify, of course, who you are, so that can be entered into the record, as well as, if you do represent any kind of citizen group or public group or just yourselves, we'd like to know.

So, without any further ado, is there anyone that would like to enter comments at this time?

Susan.

MS. FALKOFF: My name is Susan Falkoff. For the past nine years, working for a thorough evaluation and clean-up of the Watertown Arsenal has been an important part of my life.

I've worn a number of different hats in my efforts. I've worked as a member of Watertown Citizens for Environmental Safety, as the WCES representative to the Re-use Committee, as the Chair of the Environmental Sub-committee of the Re-use Committee, and as the Community Co-chair of the Restoration Advisory Board.

My work and the hard work of many others will soon culminate in the record of decision which will incorporate the comments you are hearing tonight on the propose plan for the outdoor remediation of this site.

been much more controversial. When the community began its discussions with the Army, pristine clean-up was our goal. At one early meeting I stated: `Why don't you just assume we want to build a really big day care center?'

The problem with that was that no one in the town really believed this was the best reuse for this historic site. We also came to realize, that once something was broken, you can fix it, but it will never be exactly the same. And this land could never be really returned to any state you could call pristine.

So, we gradually modified our request to the more technically acceptable language for unrestricted reuse. And for a long time, the community was united around that goal.

For some, it remains a goal which should not be compromised. And I respect them for stating forcefully their case. In the meantime, however, the Army has developed guidance for cleaning site to the intended reuse as identified in the reuse plan.

This has not sat well with the community that developed a reuse plan as a goal, but wanted very much the flexibility to adjust to new ideas and changing economic realities, which could potentially include more housing.

Gradually, however, our thinking evolved further to question whether the flexibility to develop the entire site for housing really was necessary. Some members of

goal of restoring the green areas for safe and unrestricted future use. The consensus of the Committee that night was that with this change, the proposed plan is fully satisfactory to the Re-use Committee.

On behalf of the community, I thank Colonel Blose for this change at the April 20th meeting, and I would like to do so tonight for the public record. With the change presented by Colonel Blose, I am satisfied with your proposed plan.

I believe it will protect the safety of users, abutters, and trespassers on this property to the extent possible by technical and scientific standards as we understand them today.

I also would like to go on record as being especially grateful to the Technical Assistance Program of the EPA, without which, I would not be able to state these opinions with level of confidence I feel tonight.

Thank you for the opportunity to make these remarks, and I look forward to continued collaboration with military officials and state and federal regulators as we move forward on the actual clean-up and development of this site.

THE CHAIRMAN: Thank you, Susan. There are copies, by the way, of the proposed plan on the table as you came in. If you happen to pick one up, very good. If not,

they were private, whether they were federal -- what trucking companies, perhaps are arranging this transportation for various hazardous waste areas around the country.

I hope we can publish the names of the private contractors that are indulging in this military reparations program. I thank you very much.

THE CHAIRMAN: Thank you Mr. Chase. The podium stands open for questions, comments? Ma'am.

MS. BELYAVSKY: Good evening, everyone. I represent maybe people who live in Watertown, because I have been living for five year, 465 Arsenal Street. It's very close to former laboratory.

We all know history of laboratory. Before 55 acres of land from the laboratory were sold to Town of Watertown, it was used during 150 years.

And I don't think so, that this soil was less contaminated than soil of laboratory. It would mean very much because this territory, what was sold to Town of Watertown, became a shopping mall, Arsenal Park, condo and a public park.

Arsenal Park, it is wonderful recreation area where every year, in almost all year around and especially the summertime, are a lot of the children, a lot of young people who play soccer, volleyball, basketball and cook

of former laboratory because in laboratory work limited amount of people.

Arsenal Park and the public park is wonderful recreation area. I'm so sorry about my language because I only have been living here for five years, but I want to make this comment.

My name is Kira Belyavsky, B-E-L-Y-A-V-S-K-Y. All set?

THE CHAIRMAN: Thank you. Once again, I would like to, while there are questions and concerns raised here tonight, we are talking on the soil remediation on the current site.

So, Mr. Chase and Mr. Paone and the rest of us will be here after, when we're off line and maybe we'll talk about some of those subjects as well. But, I would like to bring the focus back to the remediation of the soils.

And having said that, I would like to introduce or call up a Ms. Lisa Bouchard. She would like to comment on behalf of the Watertown Community Housing Incorporated. And I won't read the rest of the card out loud, Lisa.

MS. BOUCHARD: Thank you. My name is Lisa Bouchard, and I'm the Executive Director of Watertown Community Housing Incorporated, which is the local 501C3 Community Development Corporation here in Watertown.

We're charged with assisting first time home

aging in place and need either ramping or wheelchair accessibility.

So, our feeling is that the one opportunity that the Town has is the Arsenal site. And although we are very pleased that there's a mix use development plan on the table and think that the Arsenal Re-use committee and the RAB has done an excellent job of developing a sustainable plan, our feeling is that as the Town's demographics change, there needs to be opportunities to change with it.

And by limited the soil remediation in some areas to less than residential levels, our feeling is that it, it doesn't give the town flexibility in the future to make other kinds of decisions based on their housing needs.

The median home priced here in Watertown is rising, disproportionately to the median income. So, it's a mismatch of factors and we had very high hopes for the Arsenal site being that opportunity for the town to be able to grow and to provide housing for its current residents and its future residents.

So, in general, we appreciate all of your hard work, but we are disappointed and hope that you will reconsider in terms of the soil remediation. Thank you.

THE CHAIRMAN: Thank you, Ms. Bouchard. At this point, I would like to introduce Mr. Paul Denning. Mr. Denning handed a card in as he came in this evening, and I'd

progress it has made by making such an impossible request. These agencies further claimed they were confused as to who was speaking for the town.

Quite a response for such a safety request. My request was based upon my own fears and those most residents living in this area. Far too many to be shrubbed off as inconsequential. However, the request file process, we went through the formal letter writing channel asking you for better clean-up.

Our federal representatives did this as well. Once the counsel voted for the resolution, we knew we had done all we could. The answer, not surprising was: "No, there isn't enough money."

I can't accept the notion that the Army won't do a complete and proper clean-up because of money. You say approximately $90 million will be spent on the site before you're finished.

I ask for the $1.5 to $5 million, your estimates, needed to complete the clean-up job to which the citizens of Watertown are entitled.

This should not be treated as a frivolous request. I believe we gave up the fight for this maximum clean-up too soon. After the Re-use Committee letter was written making the request, I informed Congressman Kennedy, Senator Kennedy and Senator Kerry.

There have been repeated reports and concerns about contamination found in Arsenal Park and the Charles River. The neighbors of the Arsenal area and the citizens of the town have reason to be skeptical.

In a recent issue of the Watertown Press, the Arsenal's Public Affairs Director, Chuck Paone, called this request for additional clean-up a non-issue.

In his letter, he portrayed the clean-up more as an indulgence ignoring the fact that federal law requires all of what has been done. "Don't rock the boat," we are told.

Clean-up in my view is the only issue. If you don't clean it properly now, how many years will it take before we have a study showing those living, working, or playing around the site have been exposed to a higher health risk.

These are my major concerns. That is why I sponsored an increased clean-up resolution and why I'm here this evening. I won't ever stop being concerned about the Arsenal, Watertown, Arsenal site.

Especially when I read about other sites around the country that were thought to be safe. Thank you.

THE CHAIRMAN: Let the record show that I've accepted Mr. Denning's letter and included with the Court Reporter for inclusion into the public record, as well as,

about the lack of money, the fact that there is a limited amount of funds to clean up sites throughout the country. However, I think for two reasons it is necessary for us to reconsider, I would hope the Army would reconsider in the case of Watertown.

Unlike most of the other sites, where we have shut down Army bases nationwide, number one, this is a very urban site. The majority of formerly used defense sites, be they Army bases, Air Force bases, Naval stations are not densely urban areas.

And therefore, any soil, any property which is not able to be use to its fullest potential does not have the same value, does not have the same great need as is necessary here in Watertown, where we have only four square miles to work with.

Secondly, unlike probably the vast majority of defense sites that have been shut down nationally, we have a prior history here in Watertown where, in fact, the majority of the formal Arsenal property has already been turned over to the town.

And it was turned over the town at a time where there were no or few environmental regulations. And the concerns of the people of Watertown are still there that there is significant contamination in the area that has already been turned over to the town with very little, if

In particular, I appreciate the fact that there is a greater, that after the original proposal there is more being cleaned up, the two additional areas F and T.

However, as we can see from the map, there are a number of other areas. And even if it were not possible to clean the entire site up to residential, I do believe the Army could have done much more.

I would ask that the Army consider the, for a small additional cost to do the greater clean-up to allow the piece of mind of the people of Watertown to allow the less fear of health hazards in the future in the soil contamination that will be remaining when the Army leaves. Thank you.

THE CHAIRMAN: I do not believe we've heard from everyone in the audience. Open podium. Ma'am.

MS. PETITTO DEVANEY: My name is Marilyn Petitto Devaney. I'm a life long resident of Watertown. I don't have a prepared statement, but I will give a written statement. I understand we have a couple of more weeks.

I expected to hear more this evening. I can't remember when I wasn't involved in the Arsenal. I remember in 1978 asking, questioning about the nuclear reactor. At that time, I was told it was disassembled and it was gone.

And I find out a few years ago that I was lied to. So, I didn't start out with a very good impression. I'm

up. And they were called off the job at that point. That scares me.

Fillipolo Park is not included. This is the former Arlington Street Park. I'm very concerned about it because I have friends of my generation that were there playing as kids and saw the Army coming in in the trucks and dumping in Solland's Pond and so forth.

I know fire fighters that were there fighting the, we used to be a dump, and they dumped a lot of things there. And they'd be standing there and they would see that the water was yellow, gold, orangey. This is scary, you know, I'm afraid of the rate of cancer. I'm very concerned about that, about the area of people who work there.

I worked there myself for a time, so, I don't know who much I was exposed to, but I know that children are playing on that park in Fillipolo.

And it's a deep concern to me, and I'm going to do everything that I can to see that that is, that we test down there because we don't know what we're doing with our children.

You know, we see it in other towns and cities and this is another subject, but I have a friend that lost a child in Woburn. So, I know, and that was 13 years ago. So, I'm very worried. My daughter played on Fillipolo, too.

So, I just wanted to give those, just those kind

THE CHAIRMAN: Okay. Thank you. Just to reiterate. This is not, this is not the final step of the process, once again.

We are in the middle of the comment period and if you walk out of here tonight with other concerns or concerns that you did not voice here tonight, this comment period runs up until May 22nd.

So, as you mentioned sending a letter in, by all means. If there are other that want to follow the same track, please do so. Get them to us, I guess postmarked by the 22nd of May and they'll be entered into the record and will be dealt with in a responsiveness summary.

We have an open podium. Sir.

MR. D'ALANNO: My name is Rudy D'Alanno. I was former President of the East Watertown Betterment Association for 25 years. I'm not Vice President.

And I'm sorry our President is in the back of the hall here and I didn't see him come in, and I thought he wasn't able to come so I was going to say a few words, but maybe he'll follow up on what I have to day.

I was born and brought up in East Watertown, and I'm not ashamed to say I've been here for 71 years. Always in the same local, in fact, I just build a new home, just lived in it last year. I'm very proud of East Watertown.

The main thing that bothers me and I don't hate,

Thank you very much.

THE CHAIRMAN: Sir, I'll assume you're the President. He kind of put the, put the onus on you to say something. Did you want to come up?

UNKNOWN: After listening to the speakers here tonight, and I've regretted the health, the health assessments, I'm afraid. Am I going to be living next year? I'm afraid of to talk anymore.

Just this morning I had breakfast with a retired engineer of 40 years of the Arsenal. He said to me, I've been there for 40 years now, I'm still living. I have no problems. But, who blame here. It seems to be quite a problem according to our elected town officials who voted on or had some part in voting on the committee's here in directly to the town manager.

And here, tonight we find out that they're concerned about our health after the fact. Can we get some answer here tonight. Is there a problem? Is there a risk problem? Am I safe to walk down the Arsenal Mall? Am I safe to walk into the Arsenal?

I see, Carmen over there, he's worked the Arsenal for many years. We grew up together in these chambers, he and I and we're still living. I don't know, is there a risk, is or isn't there a health factor here? Can we get an answer?

THE CHAIRMAN: Thank you. I have an open podium again. Other concerns? Other comments?

(No response.)

THE CHAIRMAN: No other comments? No other records to enter into the public record? Yes, ma'am.

MS. PETITTO DEVANEY: I'd just like say, I was talking as a life long citizen, what I feel from my heart, but I was not talking for the counsel, but I am a member of the, I represent everyone in Watertown on every street. I am a counselor at large.

THE CHAIRMAN: Okay. And will you, can you note that in your letter that you are sending to us?

MS. PETITTO DEVANEY: I can.

THE CHAIRMAN: Either way you want to go with that one. Sir?

MS. ROBERT CHASE: I'm sorry to come up with a second comment, but it's Bob Chase again, only as local resident, and we did have a problem when we took over the first part of the Arsenal.

We didn't have the resources that have been made available on this second step on the Arsenal recovery, but we tried to be as rational as we could.

And one of the hottest areas that we new of, but we never got a report on it. We ask for reports from people that we thought were responsible, but there weren't any

but I, I just, I still think this is the greatest place in the world to live. One the other hand, our government is continually degrading the process.

And Grecian's Law operates in political, as well as, economic areas.

THE CHAIRMAN: Let me bring it back again. Let me bring back the soil remediation. And let me see, do we have any more comments regarding our proposed plan for soil remediation at the Arsenal.

(No response.)

THE CHAIRMAN: With no other comments for the record, I'll call the public hearing to a close.

(Whereupon, at 7:58 p.m., May 13, 1996 the above hearing was concluded.)

APPENDIX C.4

SUPPLEMENTAL DOCUMENTATION ON CHANGE IN SELECTED REMEDY

PROCEEDINGS

[7:00 p.m.]

MS. FALKOFF: The Reuse Committee would be interested to know, John Arasian [phonetic] is very regretfully not able to be here this evening and has asked me to chair in his absence. He notified the Reuse Committee of that, but RAB members are probably hearing that for the first time, so he is really sorry not to be here.

John also sent a letter that the Reuse Committee members have received. Are there copies for the RAB members? Okay. So, we will pass that around.

Since not all the Reuse Committee members and the RAB members know each other, I want to -- Maybe people can say who they are and which group they're part of, around the table.

I'm Susan Falkoff, co-chair of the RAB and chair of the Environmental Subcommittee of the Reuse Committee.

MR. DENNING: I'm Paul Denning of the RAB and also on the Town Council.

MR. RAGO: I'm Richard Rago and I'm on the RAB.

MR. STEDMAN: I'm Steve Stedman and I'm on the Reuse Committee.

MR. CHASE: Bob Chase, Reuse Committee.

MR. SHERRY: Tom Sherry on the Reuse Committee.

MR. PORTZ: John Portz on the Reuse Committee.

No constituents were detected above the practical quantitation limits in the soil samples collected from Areas D, H, I, and O; therefore, soils from these areas are not considered hazardous material.

Because the sampling results from Areas B, F, J, K, and L did not exceed regulatory levels, soils from these areas are also considered nonhazardous. With the exception of Barium, no other sampling results from these areas were reported above the practical quantitation limits. Barium results range from 0.52 to 1.1 milligrams per liter (mg/L) which are significantly lower than the regulatory level of 100 mg/L.

No SVOCs, pesticides or herbicides were detected above the practical quantitation limits in the soil samples collected from Area M. However, three metals barium, chromium, and lead were reported at 0.91 mg/L, 0.054 mg/L , and 5.1 mg/L, respectively. Only lead (5.1 mg/L) was detected at a concentration that exceeded the regulatory level of 5.0 mg/L. Because the results slightly exceeded the regulatory level for lead, soils removed from Area M may require hazardous classification.

If you have any questions regarding this submittal or require additional information, please do not hesitate to contact me at (207) 775-5401 ext. 3637.

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.

Nelson Walter, P.E.
Project Manager

Enclosures

cc:
K. Tringali (ARL-WT)
M. Borisky (ARL-Adelphi)
R. Hager (MRD)
A. Simenas (MADEP)
M. Cassidy (USEPA)
S. Ferguson (SWETS)
S. Falkoff (WCES)
File
J. Okun (O'Reilly, Talbot & Okun)
F. Mack (Watertown Free Library)
B. Chase (RAB)
P. Hoskins (Weston)
J. Waugh (AEC)
A. Bates (ABB-ES)
N. Glucksberg (ABB-ES)

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO ATTENTION OF

CENED-PD-M

31 July 1996

MEMORANDUM FOR COMMANDER, U.S. Army Environmental Center, ATTN: SFIM-AEC-BCB, (Mr. Waugh) Aberdeen Proving Ground, MD 21010-5401

SUBJECT: U.S. Army Materials Technology Laboratory (MTL), Watertown, MA, Comments on Draft Record of Decision (ROD)

1. Reference: Draft ROD Summary dtd June 96.

2. We are providing updated information for your reference in the ROD. As part of our predesign efforts, our office contracted with ABB Environmental Services to perform Toxicity Characteristic Leachate Potential (TCLP) sampling on soils at the MTL site. Earlier this month we reported that the test results for Area I were negative indicating non hazardous material; and positive for Area M, indicating a hazardous classification. Subsequent laboratory reports for the remainder of the sampled areas at MTL show no further failures, indicating the soil would be classified as non-hazardous.

3. The above information will impact the cost information presented for alternative S6, Soil Excavation and Off-Site Disposal/Reuse. We estimate that project costs for this alternative would now be in the $5-6 million range, but leave the detailed estimate to your office and contractor. Also, performance times, while not TCLP related, should be reduced. We estimate that design/contracting requirements for this alternative would allow construction to begin in about six months and remediation could be completed in six to nine months.

4. If you have any questions, please call Mr. Waskiewicz at 617-647-8607.

FOR THE COMMANDER:

WILLIAM C. SCULLY
Deputy Division Engineer
for Project Management

Copies Furnished:

U.S. Army Material Technology Laboratory, ATTN: AMSRL-OP-WT-ER (Ms. Tringali), CARETAKER FORCE, 395 Arsenal St., Watertown, MA 02172-0001

Meghan Cassidy (HAN-CANI), US Environmental Protection Agency, JFK Federal Building, Boston, MA 02203

Albe Simenas, Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup, 1 Winter Street, 5th Floor, Boston, MA 02108

Estimated Capital Costs for Alternative S6:
Soil Excavation and Off-Site Disposal or Reuse—Site Reuse Scenario 3

Item	Description	Quantity	Unit Cost ($)	Total Cost ($)
1	Excavate, transport, and stage contaminated material	23,600 yd^3	13.60/yd^3	320,960
2	Transport and dispose of excavated material as contaminated waste at a landfill (without stabilization):			
	• Hazardous waste (550 yd^3 @ 1.4 tons/yd^3 = 770 tons)	770 tons	246/ton	189,420
	• Nonhazardous waste (23,050 yd^3 @ 1.4 tons/yd^3 = 32,270 tons)	32,270 tons	65/ton	2,097,550
3	Backfill excavated areas:			
	• Import and place clean soil at excavated areas, grade and contour	23,600 yd^3	16.10/yd^3	379,960
	• Import and place topsoil, 6 inches thick	3,940 yd^3	13.80/yd^3	54,372
	• Seeding and mulching, revegetation	23,600 yd^2	0.72/yd^2	16,992
4	Other restoration issues and landscaping	lump sum	8,000	8,000
5	Construction air monitoring	lump sum	10,000	10,000
6	Health and safety during excavation	113 days	750/day	84,750
7	Excavation stockpile sampling and analysis	95 samples	2,000/sample	190,000
8	Excavation delineation sampling, mobile laboratory	113 days	2,000/day	226,000
9	Erosion and sediment controls	lump sum	10,000	10,000
10	Permitting	lump sum	7,500	7,500
11	Mobilization/demobilization	lump sum	10,000	10,000
12	Institutional controls for contaminated soil underneath buildings	lump sum	5,000	5,000
13	**Subtotal**			3,610,504
14	Engineering, procurement, administrative, and legal costs (20%)			722,100
15	**Subtotal**			4,332,605
16	Government construction management (7.5%)			324,945
17	Contingency (25%)			1,083,151
18	**Total** (Rounded)			5,741,000

Alex Liazos; 11 Otis St.; Watertown, MA 02172
15 August 1996

Bob Chase, RAB co-chair
Army Research Laboratory
395 Arsenal Street
Watertown, MA 02172

Dear Bob:
This letter is in response to your 9 August 1996 memo to the RAB.

First, let me state plainly that at the 8 August meeting I did not oppose off-site disposal of the soil. Rather, I did not think that we could or should decide on the proposed change in clean-up that night. This was a major change and it should be given more thought and debate than one night could afford. Given that we have been meeting for years, and given that we never discussed at any lenght off-site disposal (since it never seemed a viable option), it seemed wise to wait a few days. I regret that there will not be a RAB meeting before 21 August so we could discuss, ask questions, and debate before we made recommendations. That would have been the best course for Watertown and for the environment.

First, let me applaud the EPA's preferance for cleaning up soil instead of buring it somewhere else, even if it does meet standards for other uses. We should clean up, not move to another community.

Second, there is a new issue that occurred to me a few days after the meeting. Since all soil will be new and clean soil, does that mean that we will now have residential clean-up standards throughout the site? In a conversation 13 August Dennis Waskiewicz told me that he thinks that will be the case. If so, it should give the town more flexibility of future uses.

Third, we need some explanation of the process of off-site disposal. Are there any possible hazards, such as dust created during the clean up? I do not assume there are hazards, but some of us need some explanation and assurance.

In conclusion, I offer a qualified endorsement of off-site disposal. We need answers to the above questions. But even more, as I note above, it would have been much better if there were more discussion before the 21 August deadline. I hope there will be an opportunity to explore all concerns and questions at our Sept. meeting.

Sincerely, Alex Liazos, RAB member

Alex Liazos

THOMAS J. STEVENS

13 LAWRENCE STREET, WATERTOWN, MASSACHUSETTS 02172-1859

Mr. Robert Chase
Co-Chair, Restoration Advisory Board (RAB)
U.S. Army Research Laboratory Caretaker Force
ATTENTION: AMSRL-OP-WT
395 Arsenal Street
WATERTOWN MA 02172-2700

RE: Your Memorandum of 9 Aug 1996 to RAB

Dear Bob:

It was nice to have finally again been able to attend a RAB meeting, specifically the one held jointly last Thursday (8 August) with the Town of Watertown's Arsenal Reuse Committee. Although I walked in late, the discussion, documentation provided and prior correspondence, meetings and experience allowed me to get "up-to-speed" rather quickly.

Your recent memorandum (dated 9 August 1996) further summarized the meeting and invited RAB members to express their views on their preference of either chemical oxidation or off-site soil disposal as remediation methods for the former MTL site. I sensed that my animated response may have been mis-interpreted as adversarial or at least attitudinal, so I would like to take this opportunity to recapitulate my preference for chemical oxidation to remediate the soil contamination at the "Arsenal" site.

The way I see it, both methods are time-uncertain in reality, but one has the potential for an earlier completion by about one year. Both involve certain assumptions, such as no "new" contamination will be "discovered", funding remaining intact, safety concerns being met and cost/time estimates proving to be accurate. The risks and benefits for each may be found to be inaccurate but likewise may well prove to be correct. It seems to me that the potential (i.e., unproven) savings of one year provides a minimal benefit to the Town in that only one year of additional tax revenue MIGHT be realized, assuming that development and any related Town-acquisition actually goes on-schedule. Historically these "golden egg" delusions realize a lot of false leads, broken promises and delays. Even if both plans could guarantee a definite time-line, I would still prefer the on-site chemical oxidation method for environmental, safety and ethical reasons. I would also feel that the chemical oxidation method would best address any new "discoveries" of previously unrecognized contamination that off-site disposal could not. I have briefly summarized my comparison of the two methods as follows:

UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY

RESTORATION ADVISORY BOARD

In the Matter of:

HEARING RE:

FEASIBILITY STUDY REPORT
REUSE PLAN

Town Hall
Lower Conference Room
Watertown, Massachusetts

Thursday
August 8, 1996

The above entitled matter came on for hearing, pursuant to Notice at 7:00 p.m.

BEFORE: ROBERT CHASE
U.S. Army Research Laboratory
395 Arsenal Street
Watertown, MA 02172

ORIGINAL

PRESENT:

SUSAN FALKOFF

ALEX LIAZOS

RICH RAGO

DENNIS WASKIEWICZ

PAUL DENNING

THOMAS SHERRY

ROBERT CHASE

TOM STEDMAN

JOHN PORTZ

BILL YORK

MARK BOYLE

MR. YORK: Bill York on the Reuse Committee.

MR. LIAZOS: Alex Liazos on the RAB.

MR. BOYLE: Mark Boyle from the Town Planning.

MS. FALKOFF: Okay. Good. As you know, we're here because there's some new information that's led to some new thinking about the clean-up and I think I'll just turn the meeting over to Dennis, who's going to tell us about this.

Dennis Waskiewicz from the Corps of Engineers.

MR. WASKIEWICZ: All the slides that I have are all in the packet that you got. Does everybody have a packet? Or, anybody that didn't get a packet. Okay.

What I'd like to do is to just briefly go over what's in the proposed plan for the remediation, the soil remediation at MTL, and, then, go into some of the test results that we had from sampling we did this summer and indicate what it does to both the preferred plan, preferred remedy, and the contingency alternative.

The proposed plan lists a preferred remedy of excavation and treatment with chemical oxidation. Basically, what this means is that we're going to excavate soil to approximately three feet deep, initially, and in an aerial extent until we find that we have soil that needs clean-up holes.

The chemical oxidation involves adding water and

chemicals, which are silicates and various oxides which are proprietary to a couple of companies that do this; mix it all together and what it does is, it oxidizes organics and in some cases, what they call complexes heavy metals to put them in a different form.

Because it's an innovative technology, we're not sure it's going to work for the soils at Watertown, so we've always been carrying a contingency alternative, which is excavation, the same as the other one, and off-site disposal or reuse. This will be implemented -- the proposed plan indicates that it will be implemented for a couple of reasons; if the treatability studies on the chemical oxidation fail, or if the economics change such that chemical oxidation is no longer advantageous.

The Army has a proposed plan and a preferred alternative; so, why are we here?

As part of our general information gathering, as part of our pre-design activities, we did some sampling and did some, what we call, TCLP, or toxicity leaching procedure. It's on the next page. And, those test results provides some information which changed some of the evaluation criteria for the alternative plan; mainly, they reduced the cost by about one-half. Because of this and because these are part of the factors in selecting the preferred remedy, we thought it would be important to bring it back before the

community to reevaluate these

I'd like to spend just a minute on -- Let me go to another slide here. Okay.

So, what is a toxicity characteristic leaching procedure?

Why we gathered it is because it provides information that allows us to evaluate disposal options. More basic than that, what it does is, it takes a sample of soil, runs a liquid through it, like water or an acedic acid and measures the amount of contaminants that come out in that liquid. It's used to identify what's hazardous in terms of a definition and what's non-hazardous.

Up to this point, all our studies to date in the remedial investigation and the feasibility study, we have been making various assumptions as to what the hazard classification would be. And, for disposal purposes, we're assuming a 50/50 mix; 50 percent hazardous and 50 percent non-hazardous.

What really drove us to doing some additional testing this summer was -- you're aware that we're trying to accelerate clean up of Building 131 and adjacent soils. We knew we were going to do off-site disposal for that one area of soil remediation, so we did a TCLP test specifically for that, but then expanded it to the rest of the MTL site to evaluate that also.

Now, one thing that TCLP does not do, it doesn't affect the risk. So, all the clean-up plans and the preferred plan that was developed through the whole RI/FS process remains the same. In other words, the basic testing that was performed since 1991 defines which contaminants are contaminants of concern, which ones cause risk and which ones require remediation.

Just quickly going over what these TCLP results were. You can see -- Basically, I'll sum up some data tables and various people have this.

For the whole MTL site, except what we call area "M", the TCLP results were negative. In other words, the contaminants were not leached out by passing a liquid through them. This puts the soil into a non-hazardous classification. Area "M", which is an area along the Charles River, on the south side of North Beacon Street, did have a positive TCLP test, which classifies it as hazardous.

Now, I didn't know whether I was going to get into any data, but just in looking at some of the levels that were reached in this TCLP test, and I've got a couple of footnotes down at the bottom talking about that the contaminants coming out are the analytes, were not detected about the Practical Quantification Limits, those things that can be measured in the lab, except Barium and Chromium. And, I'm talking about two orders of magnitude here. There

were two orders of magnitude less than evaluation criteria. And, what that means is, like for Barium, the TCLP test was yielding results of one. The evaluation criteria is a hundred. And, that's what we mean by two levels of magnitude here. Similar for Chromium, .05 versus 5.

The area M failed for lead only. There was Barium and Chromium there, but it didn't fail for those.

The significance of this is, I mentioned that we gathered TCLP to evaluate disposal options. Non-hazardous soils can be used in reuse as a daily cover at landfills, or in asphalt batching. Hazardous materials have to go in a landfill as a hazardous material.

What really becomes important is the cost to do this. Right now, costs for daily cover, and even though somebody's using this material, we still pay to take it there, are $65 a ton. Hazardous material is $245 a ton. So, there's a factor of four here.

FROM THE FLOOR: It seems like the biggest problem is the organics.

MR. WASKIEWICZ: TCLP is done for the organics, for the pesticides and the others. In effect, all the organics were leaching out at less than the quantification level.

MS. FALKOFF: Are you saying that all the soil except for Area M is reusable?

MR. WASKIEWICZ: In terms of daily cover and landfill or asphalt batching, yes.

MS. FALKOFF: One hundred percent, except for Area M, can be reused?

MR. WASKIEWICZ: That's the way our tests show right now; yes.

FROM THE FLOOR: Dennis, could you just explain Area M.

MR. WASKIEWICZ: Area M is at the east end of the MTL property, actually on the yacht club property, and the TCLP there failed for lead.

FROM THE FLOOR: What do you mean, on the yacht club property? Is it on the site?

MR. WASKIEWICZ: It's on the property, but it's on the yacht club site.

MS. FALKOFF: So, it's not the grassy area down by the bridge. It's a little bit west of that.

MR. WASKIEWICZ: It's in the boat storage area, right by the boats.

MR. LIAZOS: It's across from North Beacon Street.

MR. WASKIEWICZ: Yes.

MR. LIAZOS: It's the site that's going to be reused.

MR. WASKIEWICZ: It's on the site which is proposed to go to the MDC. The whole south side of North

Beacon Street. I don't have a drawing.

FROM THE FLOOR: When you say "reusable", do you mean used in the arsenal or some other place?

MR. WASKIEWICZ: At an approved landfill. All landfills, the way they operate, they bring in our trash and spread it out and every day they put a layer of soil over it. This can be used as a daily cover that's needed to do that.

FROM THE FLOOR: And, if you do that, then, are you going to replace it with different soil here?

MR. WASKIEWICZ: That's correct. What we do is, we excavate and we have a hole and then we have to bring in clean fill.

FROM THE FLOOR: How clean is that fill? I'm serious.

MR. WASKIEWICZ: Let me just relate to another major backfilling thing we did. When we backfilled the fuel tank farm. In fact, let me talk about backfilling totally.

FROM THE FLOOR: Can you test the soil for Arsenal Park, what laboratory used given the 150 years?

MR. WASKIEWICZ: I guess that's a different subject, but, yes, we have. We have --

FROM THE FLOOR: Both times. This time it is different.

MR. WASKIEWICZ: We have tested it in 1994 and

we're doing the second round of testing right now. So, we have and we're going to evaluate the test results and we're going to come to some sort of conclusion as to whether there's risk or not, just like we've done at the MTL site.

FROM THE FLOOR: Where is this result?

MR. WASKIEWICZ: Excuse me?

FROM THE FLOOR: Where is this result?

MR. WASKIEWICZ: We have published two reports so far, a preliminary assessment in 1993 and that report is in the library. Then, in 1995, we have published a supplemental investigation report, which reports on all the data points that we took, and that report is also in the library. And, if you can't get it, call me and I will see that you get one.

MS. FALKOFF: Are you surprised by the fact that you found so little, on the basis of your previous testing, are you surprised to have arrived at these results now? I'm just wondering to what to attribute the difference.

MR. WASKIEWICZ: Well, we've never done a TCLP test. We've made an assumption which is pretty much standard procedure during the investigation phase.

MS. FALKOFF: I was just wondering how you made your assumptions.

MR. WASKIEWICZ: For one thing, we're in the investigation phase. What we're really looking to do is to

define risk. And, like I said, TCLP does not affect risk. So, it's the bulk sampling analysis, just how much stuff is there that determines the risk.

MS. FALKOFF: So, first you figured out what was there and what was risky that was there.

MR. WASKIEWICZ: Right. Then, you're able to define your areas that don't meet the clean-up standards. Then, from there, you develop alternatives.

So, to do TCLP really in the ball game, is -- Well, TCLP's are expensive, for one thing. I don't know exactly how much, but they're expensive. So, you don't want to do them just casually.

I've been told that a trained eye could have looked at the data and said your contamination levels aren't really high and we could have predicted that these may not have failed TCLP. Right now, that's second guessing as far as we're concerned.

MS. FALKOFF: So, was this the first time that you actually measured quantitatively?

MR. WASKIEWICZ: This is the first time we've determined whether or not the soils would be classified as either hazardous or non-hazardous. And, that's different than whether or not they have risk. Maybe somebody can explain it better than I can. I'm not sure.

FROM THE FLOOR: What's the difference between

being hazardous and being at risk?

MR. WASKIEWICZ: Okay. There's about four ways and I think the EPA defines whether a material is hazardous. Whether it's toxic, and that's what we're looking at here. Whether it's ignitable, like gasoline, corrosive, or gases, or reactive. I don't know if it would be reactive.

So, those are four ways that you can tell if it's a hazardous material, if they exhibit characteristics. And, they get special attention because they are hazardous and they exhibit a special problem.

In terms of the TCLP, again, we're back to the definition and toxicity is right there. What we're looking at is toxicity. So, we've looked at the soil and determined concentrations of contaminants. In this case we determined that PAH's, pesticides are primary contaminants which are a driving risk on the MTL site. There's also some metals in the soil. Those are risk drives.

We could proceed ahead without ever determining hazardous classifications. If we were to stay with the chemical oxidation, we would treat that soil and supposedly reduce the contaminants, or we would take it off to a landfill and it would confine those contaminants in such a way that it wouldn't -- they wouldn't be a problem.

If we were ever going to take it to a landfill, we would always have to go back and do a TCLP because the

landfill wouldn't accept it without that.

MS. FALKOFF: Are you saying this is more extensive testing? I feel still not really like I'm understanding the difference between the two kinds of tests. Are you saying that risk just has to do with we'll set the levels that were predefined as clean, but we don't yet know how dirty it is? Are you saying that? Can you help, Megan?

MS. CASSIDY: If we were treating the soil on site, we would never need to know whether it was hazardous or non-hazardous. As Dennis said, the purpose of the remedial investigation --

MR. WASKIEWICZ: Megan, would you mind just identifying yourself?

MS. CASSIDY: Sorry. Megan Cassidy, EPA, Environmental Protection Agency.

As Dennis just said, remedial investigation and the baseline was successful for trying to establish whether there is risk and at what level that risk is. That's your standard testing.

The TCLP information that was collected affects cost because TCLP, hazardous versus non-hazardous impacts only the cost estimate, if the material is going off site. If you're treating the material on site, i.e., chemical oxidation, hazardous versus non-hazardous is not an issue because you're cleaning the soils to the risk base number,

so it has no implications, which is why it is not uncommon that in the early phases you do not automatically take TCLP data because, again, unless you're looking at an alternative which is to take the materials off site to a landfill or some other type of reuse, you don't necessarily need to have that much detail on the classification. It really only impacts off site disposal issues. Again, it does not impact any kind of chemical or insitue treatment that you would do on the site. So, it doesn't affect the risk number, but rather what can be done with the soil once you've picked it up and now are going to take it somewhere.

MR. OKUN: Jim Okun, consultant to WCES. Let me add one more piece to what you just heard. I'll just try to explain this to you.

When Dennis and Megan use the term, hazardous, they don't mean it the way you would commonly use the word hazardous. What it means is, it ties into a set of regulations and when something is a hazardous waste, it has to be disposed of in accordance with the hazardous waste regulations. If it is a non-hazardous waste, then it can be disposed of in accordance with the regulations that govern the management of non-hazardous waste. So, when they use the word, hazardous, they don't mean hazardous as synonymous with dangerous. They mean hazardous as it pertains to a certain set of regulations of how you have to manage the material.

MR. LIAZOS: Unless you explain those words. Hazardous is something that means there's something dangerous about it, otherwise there wouldn't be any regulations.

MS. CASSIDY: This doesn't impact at all clean-up standards.

MR. LIAZOS: I understand that.

MS. CASSIDY: If we look at TCLP, toxicity, we're saying that there's something probably in the soil that is considered toxic or has some toxic features to it. But, the leaching part is what we're looking at here. This is saying, if we take this material and put it somewhere, i.e., in a landfill, is it going to -- is the material going to leach out and get into the ground. That's what this is all -- That's why, you know, if you have a hazardous waste landfill, it's very much controlled to ensure that doesn't happen. It has different collection systems. That's the TCLP. We've got something toxic in it, but is it going to leach out and impact the ground water.

So, this, again, has to do with management of the material, as Jim said, for what you can do with it, not -- it's not a risk issue. We don't say hazardous, non-hazardous. We only have to clean up hazardous. That's not necessarily the case, because you can have unacceptable risk from non-hazardous materials.

FROM THE FLOOR: I think I just translated this into my mind into layman's language? You do the TCLP to determine what you can do with the soil.

MS. CASSIDY: Exactly.

FROM THE FLOOR: So, you didn't do the TCLP before because you weren't going to move the soil, you were just going to put chemicals on it to remediate it. But, if you had -- If you did the TCLP and you found that there was -- that it was going to be classified as hazardous waste, it was going to leach out, then it would have cost you a lot more to get rid of the dirt. Is that right?

MS. CASSIDY: Exactly.

FROM THE FLOOR: You did the TCLP, you found out it's not leaching. It's cheaper to get rid of the dirt.

MS. FALKOFF: What did you do differently to test the soil?

MR. WASKIEWICZ: We added one test. You take the sample of the soil and run a liquid through it, either water or acidic acid and measure what comes out the bottom.

MS. FALKOFF: So, you did know, or you might have tested what was there, but you didn't know if it was going to be immobilized or it was going to move.

MR. WASKIEWICZ: That's right. It measures the mobility.

MS. FALKOFF: And, you don't know what contaminant

it is?

MR. WASKIEWICZ: No, because sometimes you look at a soil and see contaminants in it and that's -- the contaminants may be locked up within that soil and not come out.

MR. BOYLE: You don't know the chemical state. It could be metal.

FROM THE FLOOR: You still have to clean it up. But, now it's cheaper to remove it.

MS. FALKOFF: That's what we're talking about. It's still -- It doesn't change the hazardous information.

TOWN COUNCILOR: I think Steve pointed out where Area "M" is. Just out of curiosity, why would that be more hazardous?

MR. RAGO: Area "M", lead was detected at 5.1 milligrams per year. The criteria is 5.0. So, it failed that criteria. The soil is considered to be hazardous waste because it exhibits that characteristic.

FROM THE FLOOR: Why that area as compared to others?

TOWN COUNCILOR: I'm just curious.

MR. RAGO: It could be historic use of the property. It's over a hill, right over the road. It could be lead from an old gasoline tank.

TOWN COUNCILOR: Thank you.

FROM THE FLOOR: Slide 2, which was entitled, Soil Recommendation and Slide 5, which was TCLP. Does that imply that the only soil that would be transferred out of town would be from Area M?

MR. WASKIEWICZ: If we go ahead with the on-site disposal, right now --

FROM THE FLOOR: I'm sorry. If you do go ahead with the off-site, all of M will be taken?

MR. WASKIEWICZ: No. If we go with the off-site disposal, it will all be taken out of town, but Area M will have to go to a different place.

FROM THE FLOOR: Okay. Now, the next thing I wanted to know is, the route. I'm sure you're going to go by DOT, the truckers will go by DOT standards, but I'd like to know the route and maybe if the cops are going to explain this thing.

MR. WASKIEWICZ: Let me discuss the trucking of the material because I wanted to bring that out.

MR. YORK: Given the level at which Area M soil missed concerning the rest of the soil, would you not want to verify that?

MR. WASKIEWICZ: I believe at the time that we're actually doing the remediation, we would verify those factors.

MR. YORK: It's very close.

MR. WASKIEWICZ: Yes. That's true. As of this stage --

MR. YORK: It has a very large area on it.

MR. WASKIEWICZ: As of this date, it's still over the line and that's what we're referring to.

MR. YORK: I have another point on that. I knew we'd find out by this time, but not everything is necessarily linear. In other words, the 5.1 might be extremely high and if we look at it as 5.1 and being very close to 5, it might be something that's quite high.

MR. WASKIEWICZ: Again, I don't know if anybody does. That point is taken care of.

Is there another question?

MR. RAGO: I think the question we started on and we went off was, the soil that's coming to replace that which is removed and the quality of that.

MR. WASKIEWICZ: Let me talk about the trucking, taking the material away to the off-site disposal option and bringing new on.

What we're talking about is 24,000 cubic yards of soil right now; that's our estimate. What's 24,000 cubic yards? A really large hauling dump truck carries 30 yards. Some of them carry 20. So, what we're talking are between 800 and 1,200 trucks moving soil off. I've got an estimated remediation time of eight months.

MS. FALKOFF: How many trucks a day is that?

MR. WASKIEWICZ: This is between five to eight trucks, depending on the size, taking the material away. And, another five to eight bringing the material back on. So, we're talking between ten to 16 trucks a day, unless that same truck is used to do both, which is a possibility. When he takes away a truck load, he could come back with a truck load.

MS. FALKOFF: They'll be taking it some place that close?

MR. WASKIEWICZ: We don't direct our contractors where to do this. In terms of having an influence, yeah, we can influence that. I know that's been a sensitive issue.

MS. FALKOFF: My question is, where will this asphalt batching plant be?

MR. WASKIEWICZ: Right now, there's about -- DEP lists about nine facilities in the state, about seven of which are from central Mass. to the east.

FROM THE FLOOR: So, this could be fairly local.

MS. FALKOFF: A truck could make a round trip in a day.

MR. YORK: The closest one is in Avon.

MR. DENNING: Dennis, this is obviously very important to the residential neighborhoods, that the truck be as far removed from them as is possible.

MR. WASKIEWICZ: I can relate -- I started mentioning the job and there we moved about eight or nine thousand cubic yards in a two-week period, and that translated into about 350 trucks over ten days, 35 trucks a day. So, we've already seen worse than what we're planning here and maybe you didn't see it, which is all right, also.

MR. RAGO: Which roads are these?

MR. WASKIEWICZ: I tried to find out and I couldn't. But, basically, that was all backfill and it came from Plymouth.

MS. FALKOFF: The route was up Route 20 to 128.

FROM THE FLOOR: This past year?

MS. FALKOFF: Yes. Through Waltham.

FROM THE FLOOR: Through the town?

MS. FALKOFF: Oh, no. That was the radioactive.

MR. YORK: I'm going to guess, they may have come up 128 to the Mass. Pike.

MS. FALKOFF: And, the reason for that was it had to be a state road, which has a different level of construction and an alternative. I suppose you want to go up Galen Street and minimize the amount of traffic you're going through. Downtown Waltham is difficult.

FROM THE FLOOR: I've got a question. Now, we're talking about contaminants. A truck load of asphalt dug up, dust and everything now, is that dangerous? I have to ask

something about this now. Compared to the stuff they're taking out of there, how about a truck load of asphalt? How dangerous is that?

MR. WASKIEWICZ: Well, it carries a whole lot more PH's than the soil.

FROM THE FLOOR: That's going on at Perkins School for the Blind for a week. None of you people knew about it. Right to Alban Street to Watertown. Now, nobody worried about that. Now, we have something less contaminated here, we're all up in arms. It's something that's been going on for a week over there.

FROM THE FLOOR: We're worrying about it. We're making sure we don't have to worry about it.

FROM THE FLOOR: This is more contaminating than this stuff here we're taking out of the arsenal, the stuff, that asphalt.

FROM THE FLOOR: I don't want these things running up my street.

MS. FALKOFF: Will there be further -- In what form will there be further information available to the community about the impact on the neighborhoods?

MR. WASKIEWICZ: Well, we continue to interact with you and with whoever wants to talk.

MS. FALKOFF: I guess my question is --

MR. WASKIEWICZ: How are we going to select the

route?

MS. FALKOFF: Will there be a document on the actual method of implementation of this?

MR. WASKIEWICZ: Before we get to that point, shall we talk about whether we're going to shift plans? Our plan right now, as of today, is still the preferred remedy. Let me just mention a couple of criteria that we looked at here, to compare the two.

MS. FALKOFF: I don't mind waiting, but it feels like this is information I want to have to think about in order to decide.

MR. WASKIEWICZ: The time on that would be developed, some of the routes would be dependent upon where the final destination was for the taken away material and the stores for the backfill. That won't be selected until we actually have awarded a remediation contract. So, it would be our remediation contractor that would locate his disposal facility and his source of fill.

MR. DENNING: Could the town put requirements on what streets not to use and which streets they could use?

MR. WASKIEWICZ: Okay. In terms of -- We would not direct the contractor which landfill to go to. We could direct him which routes to use. And, if it was a more expensive route than he originally considered, then the payment, the differential in payment --

MS. FALKOFF: There's the idea that there would be roads adequate for these trucks.

MR. WASKIEWICZ: That's true. That's right.

MR. DENNING: And, I wouldn't want to have a lot of equipment going through.

MR. WASKIEWICZ: That information would be developed by the contractor in the work plans.

FROM THE FLOOR: Before you put the bid spec on the street, can't you -- you could specify a route in the bid spec.

MR. WASKIEWICZ: We actually anticipate, if we go to the off-site disposal, we would not have a bid spec. That we will go to a work plan, or a work plan type of a contract procurement here. In other words, we'd give a scope -- We would give a scope of work and we could do that.

FROM THE FLOOR: In other words, rather to create the opportunity.

MR. WASKIEWICZ: We could direct the route, but, again, we may have to direct many because if he were going north, south, there would be three different routes, perhaps.

MS. FALKOFF: Something I never thought to ask about is chemical oxidation, those machines that treat the soil, are they noisy, and how would you assess the relative noise of these two methods?

MR. WASKIEWICZ: Chemical oxidation, I don't think any of us have seen the plant work. It's a mobile plant and it come to the site. What it is, it's a -- the soil goes into a hopper, a conveyor, into a large mixing where the water and the chemicals are mixed together and there's, yes, there's a motor running with that.

MS. FALKOFF: It could potentially be more destructive.

MR. WASKIEWICZ: There would be some noise with it. It would be isolated somewhere within the MTL confines, not out in the community.

FROM THE FLOOR: Would it be louder than a jackhammer?

MR. WASKIEWICZ: No. I think this thing runs on a diesel engine.

FROM THE FLOOR: When there's a jackhammer going, it's annoying, but we still have to put up with it.

FROM THE FLOOR: I'd like to extend to feel comfortable that the soils that will be replacing, if we do the disposal, would have to come from pits. They come from pits, like pits in Charlton, or the side of a hill in New Hampshire.

FROM THE FLOOR: Is it top soil or deep soil?

MR. WASKIEWICZ: It's deep soil.

FROM THE FLOOR: I'd like to have some level of

comfort that sometimes those soils are actually worse than the ones that do come out.

MR. WASKIEWICZ: We do specify that the soil coming in be clean and we could test that also.

MR. RAGO: We've gotten soil from pits many times and we've also had samples sent in ahead of time and we tested them. As long as that level is maintained, we can take it from there. As soon as the level drops, we shut them off. You can control it.

MR. LIAZOS: Why don't we just mention those as concerns.

FROM THE FLOOR: So, this seems to set the schedule up a year and costs a little bit more.

MR. WASKIEWICZ: The numbers work out to be a little bit more, but I would say they're within the range of the contingency we're using, so I would call them basically ---

MR. STEDMAN: Plus, you also save, if the schedule is done a year earlier, you can save money.

MR. RAGO: That's true, providing that the property can actually be turned over for reuse.

MR. STEDMAN: Right.

MR. PAONE: I mean, if there's a reuse available at that time, so we could get out of the caretaker business, that's absolutely true. Otherwise the caretaker costs

really don't change.

MS. FALKOFF: We know that Chuck makes a lot.

MR. PAONE: Right there, what a master saving.

MR. WASKIEWICZ: In this slide here, some of the main comparison criteria between the preferred chemical oxidation and the alternative off-site disposal. One of the key things we're always concerned with is the protectiveness of human health and the environment. Yes and yes. They both do that. And, they did before and they would and this doesn't affect that.

The same thing with complying with the regs. Both do that.

Here we come into a change now. In the capital costs, we now have about five million dollars for each alternative. Previously, we had about ten million dollars for off-site disposal, because of that $245 a unit cost of ton that I mentioned. So, now that we're down into $65 a ton, the cost becomes equal here, basically.

The other thing that's changed and it changed because we never really looked at it before, the off-site disposal is obviously a whole lot easier to implement and we could do that without a lot of design and I'll get into that in terms of some of the schedule requirements on the next two pages. But, basically, we're cutting a year off of the schedule. And, as was mentioned in that letter that you received from

John and Susan, a year could be important.

One of the things that we look at as kind of a negative by going to off-site disposal is that it's not a treatment. And, one of the things that the government is trying to do here is to treat soil and put it back. And, not only that, chemical oxidation is called innovative, which is really a big test. So, we're losing that if we go to off-site disposal.

Basically, our trade-off becomes the treatment thing versus a year.

MS. FALKOFF: Why do you say that it's a plus?

MR. WASKIEWICZ: Well, it's a plus because the traditional thing has been to take waste away and simulate it sometimes. And, this does things fairly innocuously. In other words, we add some chemicals in water and it neutralizes the risk on this. And, because it is innovative, that's why we need to do treatability studies and we're not sure that -- You know, there's not a whole lot of track record to say that these tests work.

MS. FALKOFF: I mean, what you said puzzle me because I would think that innovative would be considered a negative in that it means that it's not tried and true.

MS. CASSIDY: Susan, the Super Fund Statute has what's called a preference for treatment, an incentive for looking for innovative technology to prevent the constant

moving of, you know, material from one site to another. But, again, that is more for the hazardous kind of situation where you have, you know, a lot of hazardous material that that method is meant to prevent just moving it from one place to another. But, there is statutory language that says preference for technologies.

MR. WASKIEWICZ: They'll probably have -- I don't know about the landfill there, or the asphalt batching plant. But, they're probably having some material already because this is not the first time this has happened. This is fairly common now, to use it in asphalt batching and covering.

MR. PORTZ: So, what you're doing is through the off-site disposal, you're not really taking this land, this earth some place else and kind of, you know, be a problem there. You're actually reusing it in a sense that it's being reused for a landfill. I mean, the landfill would have to find soil some place for that capping process. And, this is being used for that.

MR. SIMENAS: I'm Albe Simenas from the Mass. DEP. I'm the project manager for the state here. Those areas, whatever landfill that it's going to, they will have to, in negotiations with either the contract or the court, it will be permitted. And, that landfill will say we can receive X amount of that soil to be used as daily cover because in

part of their operation and the oversight for the operation of the landfill is you don't want to have piles of soil sitting there that can't be used for daily cover. And, it's the same situation with an asphalt batching plant. If the soil is removed in the wintertime, the asphalt batching plants aren't in operation, so they can't accept it. If it's done in the late summer, early fall, when they're trying to do a lot of highway work to complete things, they will be accepting more soil for doing these things. So, it is part of a standard practice of them receiving it, but it is overseen and they do have permits for doing that.

MS. FALKOFF: Well, it just seems that you didn't want to use perfectly good soil.

MR. SIMENAS: Correct.

MR. WASKIEWICZ: That's why it's listed as one of the nine criteria, nine evaluation criteria.

FROM THE FLOOR: You have said that there is approximately 24,000 cubic yards of soil to be removed?

MR. WASKIEWICZ: Yes.

FROM THE FLOOR: How much of that is coming from Area M, do you know?

MR. WASKIEWICZ: Nine hundred.

FROM THE FLOOR: Nine hundred?

MR. WASKIEWICZ: Nine hundred or five hundred.

MR. RAGO: Is that small to use the chemical

oxidation? Is there a possibility that chemical oxidation can be used, that would be considered to be hazardous?

MR. WASKIEWICZ: I think that would be too small to bring in the chemical oxidation. That's another thing that somebody would have to prove to us. The company that doesn't actually do this. They call it complexing -- That would come out in the treatability studies, if they were to do that. A sample of the soil would go to a laboratory, the chemicals would be added and then hopefully you'd get the right mix of chemicals to the amount of soil. And, hopefully, the goal is to make it work. If it doesn't, then that means the treatability has failed. Whether or not it handled the lead would come out at that time.

MR. YORK: Do you know that the oxidation procedure would work?

MR. WASKIEWICZ: It has been used and it's been on a lot of projects in the country and it has worked. So, that's why it's called innovative. It doesn't have a whole long track record, but it does have --

MR. YORK: Does it have any history of failure?

MR. WASKIEWICZ: I don't know. The companies probably wouldn't say that. But, we don't hear about the failures. We hear about the successes.

MS. CASSIDY: That's why we would have treatability work though, to ensure that it would work, that

we're not making a, you know, a five million dollar investment to bring, you know, the machinery here and then, you know, run the entire process through and then find out it failed. That's why we would be doing treatability work up front.

MR. YORK: So, at this point, you folks have not determined that the oxidation procedure is foolproof.

MS. CASSIDY: Chemical oxidation is a technology that works, but you have to look at it on a site specific, you know, you have to look at the soils here. It would have to go through treatability work and there is a possibility that we may find it cannot achieve the clean up level we have here.

FROM THE FLOOR: Whereas, if you remove the soil, the only test you have to get to is the soil that you're bringing in to assure that that is of sufficient quality.

MS. CASSIDY: That's correct.

FROM THE FLOOR: So, a safer course might be to get rid of it as opposed to try to treat it and hope it works. See if it works. Try to guaranty it works on this one site.

MS. CASSIDY: Yes.

MR. RAGO: That is why we have a contingency plan in the proposed plans. And, the way it is now, if we have some new information to shed more light on that, than that

would be great.

FROM THE FLOOR: So, if it was, and I'll use the words of a layman, more hazardous, it was more expensive to remove because it had to go to Super Fund sites. And, now since it is not at that level, it's less expensive and, therefore, possibly the preferable procedure is also cost effective, equally cost effective.

MR. RAGO: The gentleman in the back's proposal that they bring in the oxidation for Area M, I just noticed here, a hundred and ninety-five days to move 900 yards in one day. Would the Army consider doing both, additional testing, and doing that?

MR. WASKIEWICZ: I believe we have considered that and didn't have enough information to know whether it might work or it didn't work.

MR. RAGO: Like it doesn't seem worth it to do it for a 70 by 70 area.

MR. WASKIEWICZ: I don't know where the cutoff point would be, Rich. The unit is mobile. It comes up on trucks. I'm sure there's a set up time of a certain amount.

In addition to bent scale tests done in a laboratory, we would look to some sort of pilot scale. Right now, the only pilot scale that we can figure out is to bring this unit up for a short period of time and just work on it. If we had to do this too many times, it would be a little bit

extra.

But, actually, the -- Somebody else mentioned weather related restrictions of off-site disposal. There's probably some other related restrictions on chemical oxidation.

MR. WASKIEWICZ: Well, it really wouldn't work in the dead of winter very well. So, the time frames that i have here, are actually very good.

MR. DENNING: When you talked about the chemical oxidation process and what that would mean, how far you would have to dig down to treat the soil?

MR. WASKIEWICZ: Yes.

MR. DENNING: Will you, if you are to remove the soil, dig down as deep as it is contaminated?

MR. WASKIEWICZ: Yes.

MR. DENNING: So, it really would be the same, only you're taking it away rather than treating it?

MR. WASKIEWICZ: Right. Again, the depth would be -- We would stop at what would typically be a foundation excavation. I don't know if that's ten feet, or somewhere around there. Then, we'd probably stop there. But, the actual moorings that have been done to date, most of the contamination was found at two feet. The PAH's have come from surface contamination and the pesticides have come from the same thing, so it really hasn't traveled deeply.

MR. DENNING: On the face of what you're

proposing, I think the residents probably would feel more comfortable with it being taken away and treated and not still knowing for sure, for certain, whether it was safe. You know, barring the truck trips, probably would be less hazardous to the community because hauling it away rather than treating it. I guess my only concern is that it's a major change -- it's such a major change at a late date and I just wouldn't feel very comfortable that it wasn't being done in exchange to saving a year or saving money. That's really my biggest concern in making such a ---

MR. WASKIEWICZ: Right now, the -- Well, based on the information we have, the money is not a factor here to the Army because they both look the same.

MR. DENNING: But, if you cut a year off.

MR. WASKIEWICZ: Yes, but I don't think that's being considered here because like Bob said, the property has to be sold in order to realize that savings.

MR. DENNING: We have tenants who are trying to move in and I just want to make sure that we're not rushing things or changing things just to accommodate, you know, what's in front of us.

MR. WASKIEWICZ: I guess that's a community thing as to how important that is.

MR. YORK: But, the question is, Dennis, the cost of removal as compared to the cost of on-site treatment, are

they the same? Is there a disparity in those?

MR. SIMENAS: The off-site disposal is about $300,00 more expense. But, it's so close in relative clean-up costs.

MR. WASKIEWICZ: There's contingencies in each of these cost estimates that are probably 20 percent of the total.

MS. FALKOFF: Dennis, first of all, I'd like to focus that chart a little bit that Bob just put up. I notice on that chart and on the next page, also, that talks about the off-site disposal. It's got from tomorrow until August 23rd as the decision phase. What I'm wondering is, if there's a consensus among the community tonight that this sounds fine, what else has to happen in order to make a decision?

MR. WASKIEWICZ: Well, I guess that was an issue that I thought about and that I talked about with out clean-up team as to what would be a legitimate time to expect the decision.

MS. FALKOFF: Who makes the decision?

MR. WASKIEWICZ: Just to tell you what the decision time means. Right now, we're on hold and we're not doing anything. So, we're not for chemical oxidation. And, we're not looking at off-site disposal. We're waiting for a

decision here.

You know, there's a couple of things right here, mainly, pre-design work plans and treatability study work plans. Both of those are in progress in draft reports sent out for review and we're basically on hold with those until we get a decision.

How long is it going to take. Right now --

MS. FALKOFF: It's August and I could understand if you told me the whole BCP's going on vacation for the next two weeks and that's why it's going to take --

MS. CASSIDY: I think that was like we couldn't go beyond that point without really losing time. I mean, I don't think there's anything to say that, you know, if we get a feel in a day or so that that two weeks was sort of, I think, from the onset, the worst that Dennis could do for contracting reasons.

MS. FALKOFF: Okay.

MS. CASSIDY: They have rod schedules that are deliverable to the EPA that a re requirements.

MS. FALKOFF: What I want is, are there other factors that you're still waiting, that will come into play in the next two weeks?

MR. CHASE: No, the proposal right now is to continue with chemical oxidation. In answer to Paul's question, does this Army last minute change? No. The Army

is planning to go forward with chemical oxidation. We got this information on TCLP. We felt we should bring it to the community for their decision, discussion, whatever. If the community feels that they would like to save some time and the Army can reasonably meet all the other goals of safety health protection of the environment, this is a point that a community could advise the Army that they would prefer to change our remediation concepts.

MS. FALKOFF: So, our input tonight is critical.

MR. CHASE: Yes.

MS. FALKOFF: We have EPA approval. We have state approval. We have Pentagon approval. You're just waiting for the community approval.

FROM THE FLOOR: I'd like to comment that I think it would be presumptuous to immediately say that trucking would be the preferred option. There's a lot of talk in the discussion on reuse that one reason not to go to residential standards was because there would be all this -- you'd have to remove that much more soil and be trucking it around town and that was a very divisive and undesirable thing. For my own personal viewpoint, I don't like the trucking possibility.

I would also like to say that there is something very valuable with chemical oxidation in a sense for two reasons. One, is that we all know that toxic waste, when you take it

some place else, it's not going away. Chemical oxidation is possibly a way to remediate the soil in a more permanent fashion.

Secondly, there is a real -- there is a moral imperative to support the testing of these procedures because there will be place where it is not cheaper to truck the soil off site and in those places the chemical oxidation will be -- that technology could be really key in reducing an environmental hazard.

So, I applaud the federal tendency to look to innovative procedures. And, I would also like to say, as a citizen, I'm not at all sure that I would prefer the trucking, even if the chemical oxidation takes a little longer. And, also, I think that, you know, it sounds to me like further tests are going to be done on the soil and it sounds to me like there's not a hundred percent certainty which way it's going to go, even with disposal.

I mean, I don't know if you've done that in a fine enough manner to determine that all of this really is going to be hazardous to a lesser degree and cheaper to dispose. Maybe, it sounds like either option, either the trucking or chemical oxidation, there's going to be some surprises in the budget department and the procedure department, isn't that the case?

MR. WASKIEWICZ: Right. There's unknowns here in

terms of the volume of soil, that's an estimate right now. But, I guess, again, it probably wouldn't -- the full cost would probably estimate similarly to an increased volume.

MR. LIAZOS: I have a question. I haven't talked about it today. I don't understand why you can't start oxidation now. Why does it take so much longer to do the oxidation?

FROM THE FLOOR: We actually have started on our project. Just in terms of defining where we're going with the Corps of Engineer activities. As soon as we had a proposed plan, the chemical oxidation, we started our pre-design activities, which was developing pre-designed work plans, sampling and analysis plans, treatability work plans. So, all of that has been ongoing right now ever since we --

MR. LIAZOS: You still haven't answered my question. Why is it almost two years away?

MR. SIMENAS: February '98 is the date, according to that previous slide. Is that correct?

MR. WASKIEWICZ: The reason why, is it before you can mobilize the actual equipment on site, all of those columns have to happen first.

MS. CASSIDY: We don't design off-site disposal. We have to design chemical oxidation. It's an engineering project.

MR. LIAZOS: Do you want to hurry it up?

MR. SIMENAS: They're already doing the pre-design work before they have a record of decision. So, the Army is already going somewhat at risk doing all of this pre-design work that it's talked about earlier that is on hold right now. They started that stuff early to try to cut the time frame down as much as possible.

MR. WASKIEWICZ: We have worked out a schedule, in fact, with Megan to short cut the normal Super Fund losses by quite a bit in terms of design and to review documents especially. I wouldn't want at this time to say we can accelerate the process.

MR. PORTZ: Does the DEP and the EPA have recommendations on the alternative?

MR. SIMENAS: One of the things that we're looking back at the slide is that both are methods that we've looked at. We have a contingency in there in the event the situation changes, particularly if chemical oxidation does not work, we wanted to have the off-site disposal as an option to remove it. The things that you did mention are one of those balancing things. And, what balances it is that there is a thriving need to have the property quicker. It's something that balances off, whether we bring innovative technology to balance off that. I mean, one of the things we are talking about and I'm concerned with is, the soil is recycled and reused, so that the batching plant

does, although it doesn't destroy it, it binds it into asphalt and they have to do it anyway for the roads. So, this soil is something that would be appropriate use for a batch plant.

So, they're not making recommendations for either or, but it's that sheet that Dennis had up earlier shows that it's in a balance right now. And, whichever way the Army wishes to go in terms of community input, I can see supporting and working with them on either of those methods.

MS. CASSIDY: From the EPA's perspective. As you see the first two criteria there, those are -- I can't support any remedy that doesn't meet those two criteria. And, obviously, now, I have two, which I have two alternatives that meet those criteria, which, of course, is why they were in the proposed plan. Off-site disposal would not have been accepted to put forth as a contingency if it wasn't an acceptable alternative.

Then, we get into why you spend six or seven other factors as defined by the Super Fund law that are what we call balancing criteria and that's exactly where we are at this point. We have two alternatives, both of which are acceptable and, you know, both have either pros and cons, if you will, or, you know, get a plus or a check. So, really, at this point, EPA, which is a procedure the Army has to submit to us what their proposal is, we would be in a

position to concur with either of these, these alternatives.

MR. YORK: Are you saying that both are safe and they're both effective?

MS. CASSIDY: Again, the first criteria there -- We cannot accept anything that doesn't meet that first criteria. And, they both meet the overall protection.

MR. SIMENAS: ... and the DEP reviewed the materials that the government has reviewed --

MS. CASSIDY: Yes. We have reviewed all the data.

MR. SIMENAS: The phase we're in right now is, there is a proposed plan that has gone through the legal process. The proposed plan had both of these pieces in it. Where we are right now is a thing that's called a record of decision. And, what that does is, it actually puts in a document exactly what will be done. And, we're in a position right now where we can look at either one.

And, right now, the Army has said to me that they're going with their chemical oxidation; that was their selected remedy in the proposed plan. But, there's this new information that Dennis presented today that shows that the contingency plan wasn't expected expensive as it was originally put in the proposed plan. That's really the only thing that's changed right now is the cost of going to the contingency plan.

MR. SHERRY: But, at some point in time, where is

your breaking point? Where do you cut bait? Which way are you going to recommend to go? Are you going to recommend --

MS. CASSIDY: In that record of decision, that's the legal document that is required under the Super Fund law, again, right now, the Army is obligated to give us that document, that legal document with their preferred alternative. We've seen one draft. Another one is due. But, by the end of September, we are supposed to be signing off on the decision here. So, this is a critical time.

Another point that I do want to make sure everyone understands because I'd hate to be back here in this room a year from now to explain to you that with chemical oxidation, with the treatability work, there is the possibility that it fails and we still go to off-site disposal. So, I mean, that's, again, why there has always been a contingency. So, we could down the treatability track and find that it's not going to be implementable and go to off-site disposal at some point in the future, anyway.

FROM THE FLOOR: When could you find that out? At what point -- Does that mean that you don't start to look at the feasibility of the chemical oxidation until '98, or are you looking at that now?

MS. CASSIDY: In the design phase. Dennis --

MR. WASKIEWICZ: Right here, somewhere in the November time frame.

FROM THE FLOOR: November of?

MR. WASKIEWICZ: This year. November of this year.

FROM THE FLOOR: This year. So, you'd be determining the feasibility of chemical oxidation this fall; is that correct?

MR. WASKIEWICZ: Yes.

FROM THE FLOOR: Hopefully?

MR. WASKIEWICZ: Yes.

FROM THE FLOOR: So, it's not like we're going to wait two years and then find out.

I also just want to clarify, are you able to dig up the soil and remove it in the dead of winter, either; is that correct?

MR. SHERRY: It says February.

FROM THE FLOOR: The time frame is actually good if we mobilize in February, we could start putting -- you know, bringing in the equipment and stuff that's needed on site and start digging in March, or whatever. That makes for the long season.

FROM THE FLOOR: Okay. And, are you going to use Ryder trucks?

FROM THE FLOOR: I'm a member of the town council. Assuming both plans are safe, one of the concerns I have as a councilor is to have progress as quickly as possible, but

as safe as possible as mentioned earlier. It's our last chance to improve on tax base and also provide opportunity for employment. If they're both safe and you save a whole year, I certainly would encourage the members of the board to go for the off-site, from what we've heard so far. I know that's the sentiment of the people in town. We want to see this developed as quickly as possible, but of course, with all the safety factors considered.

MR. RAGO: But, you've got one more consideration here to consider at this stage. We're going to reach a point where the chemical oxidation process isn't doing. What do you do then? Do you then start to go to the off-site proposal? I'm saying, do you have to wait? I'm not disagreeing with what you're advocating. I'm saying, suppose is you don't and then when you reach the point that you're going the other route, chemical oxidation, and then you find out you can't do it that way, where can you make the right decision, or when can you make it?

FROM THE FLOOR: I think the decision has to be made as soon as possible.

FROM THE FLOOR: It's a tough one, isn't it?

MR. LIAZOS: That's very clear.

MR. CHASE: Right now, we currently have a record of decision draft, which the regulators have reviewed, that says chemical oxidation. If we get some guidance from the

community, that they would prefer us to do off-site disposal, we would have to re-write our record of decision and resubmit that to the regulators for approval. Right now, our document says chemical oxidation and that's the way we will proceed unless we get some guidance from the community that you have a desire to get us to use the off-site disposal, which may save a year in remediating the soil there.

MR. LIAZOS: Whatever guidance you get tonight, it's guidance. You decide whether to accept it or not.

MR. CHASE: If the town's guidance is strong that says that they would prefer us to change our alternative to off-site disposal, we will do that.

MR. LIAZOS: Thank you.

MR. YORK: Megan or Albe, a couple questions. If we go to the haul-off/replace, what criteria are there to give assurance that the replacement soil that's coming back is of a sufficient quality, and to make sure that the trucks bringing that in are bringing in the quality that we have been assured?

MS. CASSIDY: I'm not sure I remember your name.

MR. SHERRY: I think we can control that.

MR. YORK: I understand that, Tom, but I want to hear it from the state.

MS. CASSIDY: With the work plans that would

specify the nature of the testing to be done at the location that you're getting the soil. If you went to the alternative location, they would have to, you know, retest.

MR. YORK: And, as far as the government is concerned, when we look at the contracts, if we happen to go the haul-away route, would the types of conditions that we're talking about as to trucking routes, quality assurance review, those documents would be able to be looked at by not only the Reuse Committee, but Mr. Okun, the EPA and the DEP, prior to any final signatures?

MR. WASKIEWICZ: We do have, we have inspectors on-site to verify its condition. In fact, I mentioned the backfill of the tank farm. We rejected the fill that was brought on that didn't meet our standards. So, we do checks. That's a normal procedure, also.

MS. CASSIDY: There's a standard list of documents that they are under agreement because of their Super Fund nature, they have to provide us and we have to review. All of the line items up there are submitted for review. And, typically, historically, they've always been given, every time we get a document, it's also put out to the public through the round and information and things like that. I can't envision that would be any different.

MR. CHASE: The program managers for EPA and DEP and myself meet either every three or four weeks, reviewing

all these documents. And, we will continue to do that through the remediation process.

MR. LIAZOS: Where there was a contractor who's done that kind of work all the time and they still violated some kind of guidelines. So, the question I have in mind, can we have some assurance that in fact there's control exercised?

MR. YORK: Yes. I just want to make sure that all of this has been looked at by the EPA and by the DEP, which I'm sure that it has, and that the contracts that they will look at give us the ability to set forth the specs or the conditions that give the guaranties that the community needs.

MS. CASSIDY: To the extent that federal procurement regulations allow it, the courts submit their scopes of work, et cetera, to me and the Albe for review, that obviously the contractor's costs, you know, there is some of that that is not a public sort of issue. But, on the technical merits of a contract, we are consulted.

The only thing I just want to mention on the truck routes is, the only control that we can't have is, these truck routes do have to go by DOT regulations. And, some streets, as Susan said, they can't use. So, I mean, while you can have input, you can't send them down a street that DOT says they can't use, obviously. So, you know, you have

to work within some constraints.

MR. DENNING: Most of the streets are major --

MS. CASSIDY: Except Galen Street.

MR. DENNING: We would never send them down a side street, anyway.

MS. CASSIDY: Right. But --

MR. PAONE: If you don't do that you're in violation. And, the other slide had it where there's regulations, transportation regulations.

MR. DENNING: But, when they were hauling materials the last time, they were where they shouldn't have been.

MS. CASSIDY: And, there was no -- There was very little town oversight when they were taking radioactive stuff. It's kind of like you called the police department and said, oh, you know, where are the trucks with the radioactive material going to go? Huh? I would like to have a guaranty if we're going to be doing that trucking that it be -- that the police department is going to be kept informed and able to be involved.

MR. BOYLE: Susan, in the context of the discussion relative to the schedule, I think that the public needs to know that through the consultants of the Reuse Committee, they've advised the committee that there's a very tight real estate market presently in the Greater Boston

Area, that there's a window of opportunity in the next two years before new space comes on line that to position the property quite well for economic revitalization, at the same time, we have several high-quality companies have approached the town with strong interest in the site. Computer software. Corporate offices are in need, biotechnology.

There are windows of looking at real estate space needs that they have right now are in the next year to two, rather than two to four. Those people who know of the real estate process, know that they're always looking at needs. In the space needs that they're talking about are very consistent with the schedule for off-site.

Now, we're talking about the ability to attract the types of jobs and the types of economic revenue to the community that had been used in the reused planning process. The companies that I mentioned are consistent also with the types of jobs that we had talked about. And, certainly, the tax revenue that would be generated by that, if all other factors, environmental factors are equal.

So, I think that the community might say, well, wait a minute, you had the opportunity to create jobs one year earlier. You had the opportunity to create tax revenue for the community one year earlier. And, if there's no other problem or difference with the environmental process, I think there's a moral obligation to, as was quoted earlier,

to talk about the types of economic revitalization that's envisioned for the property.

With regard to the property itself, as you know, it's now vacant. The longer buildings and properties remain vacant, the harder it is and the more expensive it is, also, to rehab and to reuse them. Not to mention the fact that with regard to the Army's budget, it's more expensive for them to, quote, carry.

But, as you know, if the town moves forward with an economic development conveyance, that's going to be the town's project, certainly, initially, under a master lease, or a lease in furtherance of conveyance, and ultimately, to an actual deed transfer. So, the community needs to know that if it takes on a multi-million dollar project in an enormous piece of real estate, that it needs to be concerned about the ability to quickly turn that around, to get it off the town's carrying costs and to get it into private hands, as I said earlier, to provide jobs and tax revenue for the community, not to mention the property, the physical property, revitalization of the site as well.

Jonathan, who is on the Reuse Committee and not able to be here, did ask me to express a couple of issues and ask a couple of questions which Dennis did answer. She did ask in terms of the volume of the trucks, how long it was going to take. She was concerned about the entrances and exits.

But, she also did express a strong hesitancy and concern about the chemical oxidation in that it's not sure that it's going to work. She wasn't sure that she wanted that type of technology taking place, and cooking, to use her term, 300 yards from her home.

MS. FALKOFF: How about economics?

MR. BOYLE: On the economic and real estate points, I think that they can't be separated from this discussion, but they are closely related to the discussion in that one of the changes or benefits or differences of one alternative to the other is the standing of that one year, and given the information that we have, that one year may be very critical to, you know, attracting and landing, so to speak, a key cornerstone company that the community would be proud to have as its new tenant, as its first tenant, or as its major tenant on the property.

MS. FALKOFF: You know, I can answer that often what the consultants say seem like they're sort of busy in ivory towers, but I work for a company that needs to relocate and cannot find space anywhere. So, I've had some real life corroboration of the type real estate market.

MR. SHERRY: I'd like to ask one question, too.

MR. LIAZOS: I don't like to keep jumping in. I appreciate what you've said, but I want to just put it in perspective. This project started in 1988 and it's been

testing and retesting and tested a fair amount and the original clean up file date was like two years ago, whatever it was. And, I find it a little bit unnerving, I think, that with the whole new plan that within the next ten days, you know, you need that. This has been a long process, you know, this is kind of all of a sudden, you know? There was a long time. There's a lot of meetings we went to every month and all these details and the Army came out with a decision. But now the whole thing has changed. I don't know quite how to react to this. I just think it sounds to me like Russian or something. All this time, all these years, why all of a sudden, ten days, we have to say we want this change. I'm confused about it. I want to see a long time ago.

MR. SHERRY: I'll make a remark, basically. I would feel very comfortable as long as the EPA and the DEP and the agencies to whom we're looking for to support us, give us a kind of input we need when these type of decisions are going to be made. We don't have the expertise or the know-how. We do have to rely upon the state and the couldfederal government and those people to supply it.

I don't know how you can say this is a mystery or not. If you have the data and it's brought forward now and it says you can do it, what are we losing? Why don't we go ahead and do it and then depend upon these other agencies to

support us. If they say in the middle, we can't do it, then say, don't do it. What else are you going to say?

MR. YORK: What I want to say, Albe and Megan, I appreciate your input from the DEP and the EPA throughout the process and particularly this evening. Do you folks feel that you've been hurried at all?

MS. CASSIDY: I'm not sure I understand --

MR. YORK: We've now come to a conclusion this evening that you've done the studies that you've wanted to do and feel comfortable in the opinions that you've given.

MS. CASSIDY: Yes. From my perspective, I don't see that this is new. It was in the feasibility study. It was in the proposed plan. Again, the reason we put the contingency out there was the possibility that, you know, we would use the contingency. Again, that's why we set it up this way. Both Albe and I worked very closely with the Army, so, you know, none of this is new. So, I, personally, don't feel that I've been rushed through reviewing anything. Again, we get all the information in real time. And, as Bob said, we meet very regularly.

MR. YORK: Albe?

MR. SIMENAS: I'd say the same thing. It is the contingency plan and at what point we pay for the process we invoke it is really not a regulated decision at this point in time. For me, both of those -- the contingency of off-

site disposal and chemical oxidation, both will leave the site safe with the clean-up levels that we were talking about.

MS. FALKOFF: In response to what Tom said, the community does have its own consultants and I wonder if Jim Okun would like to comment on that what you think about these two alternatives?

MR. OKUN: I was going to say, Susan, that two or three weeks ago, Susan and I were at a meeting and I was hired by Watertown Citizens for Environmental Safety through a grant that they received from EPA, that supports --

MS. FALKOFF: And, we said that we would only -- that part of our deal with the EPA was that Jim would be available to the community.

MR. OKUN: Okay. So, I don't have an axe to grind here. Susan and I attended the last regulators meeting which is where the Army gets together with EPA and DEP and other interested regulatory bodies. And, Susan and I were sitting there and heard Dennis say, Well, we just got this new data from the TCLP tests, and, now, we're taking a second look at what the proper plan's going to be for cleaning up the site. And, to be honest, Susan and I sat there kind of dumbfounded because we felt we had just gone through a very lengthy detailed process to develop a plan that was on the table. Probably, most of us were in this

room this spring when Carl Blows (phonetic) was here and made the official announcement, this was the approach that the Army was going to take. It all seemed that it was signed, sealed and delivered. So, we were very surprised to have Dennis tell us that they were now reconsidering what the plan was going to be.

We told them at that meeting that we weren't objecting to a possible revision of the plan, but we were very surprised. And, we thought it was late in the game for this kind of a change, which, to us, seemed like a significant change to be cropping up. And, none of that is to discount anything that Mark just said. But, our reaction was this is a significant change, seemingly coming late in the game.

I'll give you my honest opinion, which I have voiced at other forums, which is, in general, I think that the manner in which the testing was done could have been better thought out. I think it shouldn't have happened this late in the game, that this data was available. Hindsight is always 20/20, as people say.

One question I was going to ask Dennis is, one of the things I heard as people were asking questions was, do we know whether the chemical oxidation will work. That's a question that I think has been discussed. Is there some way to get an answer to that question in some kind of expedient time frame? I know you show it starting, you know, in

September and ending in November. Is there some way that you can get the community information on that in a more expedited fashion?

MR. WASKIEWICZ: Typically, we do things, like we have a treatability work plan right now. We don't normally go ahead unless we get general concurrence from EPA and the state on the procedures that we're following. I'd hate to just jump in and send out soil samples to somebody and tell them to run it quickly without having authority of the controllers.

MR. SIMENAS: What Megan and I hear is that were to happen, then I would feel pushed.

MS. CASSIDY: Right.

MR. SIMENAS: I would feel -- If we're going to go with something that I don't know whether it's going to work, I want to make sure that I've had enough time to review what we're looking at, how we're comparing it. Because, one thing I've always been concerned about on chemical oxidation is, it's a proprietary agent that's going to be used from the oxidation. I want it compared to other oxidizing agents. I want to make sure that it isn't this sort of like voodoo chemical that's also going to change and take care of the metals and all these other things.

That time frame has been in there for the plan, it still has it up there on the sheet, so that that's the time

frame and that's why we're not going to get there until February of '98, because all those things need to be done.

MS. CASSIDY: I would just reiterate that the time frames you see here for treatability, in my mind, are as tight as they possibly can be with your expectation that we're overseeing things. I mean, Dennis and I and Albe have worked on this schedule to see where we could cut time. And, cutting any more time means we'd give up our right to, you know, look at the documents. So, there is some trade-off. Even to say November that we would know whether it's going to work, is very, very optimistic.

MR. WASKIEWICZ: Let me explain just a couple of things to at least put it in place. While we've been doing this work plan, our contractor has actually been out selecting an independent laboratory to do the actual bench scale tests. Yeah, we could send -- Albe mentioned the companies of the proprietary chemicals. We could send them a soil sample and say, turn it around quickly and probably in a month they might be able to give us something like that. But, again, we would have no confidence.

Not only that, we've also located additional companies that probably have chemicals that do the same thing. The federal government in their procurement has to be very careful about sole sourcing. If there's more than one process out there, we have to look at those. And, that's

why we've gone through and we selected an independent lab, so that they can get the various chemicals from the companies that want to compete and they will do the tests. So, that's --

MR. OKUN: Assuming you get that done by the end of November, which is what your schedule calls for, would it make more sense -- You would lose August, September, October and November. You'd lose four months.

MR. WASKIEWICZ: I see two check points here. The actual bench scale laboratory evaluation of the process. We always like to add in a pilot scale study. But, we don't see an easy way to do it here, except to bring this mobile unit to the place and start running the soil. You know, that's somewhere down in here.

MS. FALKOFF: Jim, in asking these questions, are you implying that you consider chemical oxidation preferable, if you know it would work?

MR. OKUN: I just heard a lot of questions and a few concerns in this room. And, Dennis is concerned that -- the biggest concern, that there is a preference for treatment technologies that actually destroy contaminants and at the same time I was hearing people say, we don't know if that would work, anyway. We don't know if chemical oxidation would really work. And, I thought maybe there'd be a way to answer that question which would then, if it

doesn't work --

MR. YORK: Jim, what do you think of hauling it off and the EPA and the DEP's conclusion that that is at least equally safe? Hauling it off and bringing in new soil.

MR. OKUN: I would agree with that. I would concur.

MR. YORK: So, you think that that's the safe course.

MR. OKUN: I assume the trucking can be arranged.

MR. YORK: It seems to me, and I've come to a conclusion, I am a layman trying to get all the input. I appreciate everyone being here. I actually think the removal is safer because we know that that will work, whereas, the oxidation at this site, we don't know. I also feel that that being the case with it equally safe, that the time factor of the wonderful opportunity of developing this site and being assured of the safety of what is removed and what is brought in, is an opportunity that some would say is a moral obligation to the town.

We have also been taught, I hope, to sit and think globally, which the woman in orange has pointed out. I don't think she identified herself. And, that's important, too. But, I'm glad that Megan and Albe have indicated that whatever batching areas they are taken to or landfills are

approved and that those will be safe and appropriate uses.

I am pleased and not surprised with what is presented. I know from the beginning and, God, we're going back too many years, to the course at the beginning when the government started talking about oxidation and treatment on-site, that the pushing at that point was, we'd rather take out what is bad and make sure that what comes in is clean. So, I would just say that in my conclusion, I am pleased with the option of the removal and the benefit it brings to the town.

MS. FALKOFF: Rich has been very eager to say something.

MR. RAGO: I have two quick questions. One of them is, there are PCB contaminated soils, I think. Now, those aren't TCLP type things and they can't go to a landfill, so are they handled separately? We haven't really talked about that tonight. How do you handle those?

MR. WASKIEWICZ: I'm not sure, Rich. Albe?

MR. SIMENAS: Looking at one of my sheets here that I brought with me, the actual value. If I remember correctly, the landfill, Title B landfills can accept it if it's above two parts per million. I don't have my data sheet here. We're close for that one area. It could be like the Area "M", or one other area.

MS. CASSIDY: It's going to be close.

MR. RAGO: And, the second question is, this cost page, it says originally 9.7 million, which would go for hazard. I have a strong suspicion that it's going to be less than that based on the cost of disposing the landfills and that was during the last couple of years. Is this based on August 1996 prices?

MR. WASKIEWICZ: Based on early '96 prices probably. Actually, you know, our offices continually check with vendors. The actual landfill cost itself is $35 a ton.

MR. LIAZOS: We're being told tonight that a decision was made to do chemical oxidation, which is not apparently sure it will work on this site, based entirely on cost. You just said that it's totally safe for Watertown to take the soil out, the hazardous waste, which is, of course, more money. But, it's safe for Watertown to move it. And, so far as you can tell, the only reason you can do it is 5.1 versus 9.7 million.

MR. WASKIEWICZ: Well, that's not a bad conclusion.

MR. LIAZOS: I think that's brilliant. But, if that's the case, why didn't the town commission say, well, we want it here, you know, we'll save a million and a half over ten million in storage. I'm just confused ---

MS. FALKOFF: I would not have approved it until this new information. I really lean to off-site disposal

and the really critical piece for me is that there's a really moral reuse for the soil.

MR. STEDMAN: Beneficial. Beneficial reuse for the soil.

MS. FALKOFF: Yeah, beneficial. I feel really good about that.

MS. CASSIDY: Just for the record. No decision has been made until EPA finds the rod, there is no decision.

MR. DENNING: Bob had said, you know, they're going toward chemical oxidation and unless there's a strong, you know, desire shown by the community. And, I guess I'm wondering what form is that going to take?

MS. FALKOFF: I think that there's a clear consensus here among the people tonight. I think it's been a really good meeting. People have aired a lot of issues. Maybe John may want the Reuse Committee to take a formal vote and I wanted to get a sense of the values as it relates to render opinions. I'm wondering if we can move toward a process like that.

MR. DENNING: Well, as someone who represents a good chunk of the town that abuts the arsenal, I have no clue what they think. I don't even know what Larry thinks is best. So, when you say a strong decision by the community, a recommendation by the community, I take that to mean people who live in the community, not just us on the

board and not just a few people here tonight.

So, I would feel uncomfortable making a recommendation until I knew more and polled the people who live down there.

MS. FALKOFF: There are quite a few people on the Reuse Committee. John?

MR. PORTZ: Well, there's certainly pros and cons to the different options. But, I think given that both options in terms of the disposal, you know, protect the basic health and safety. I would certainly opt for the off-site disposal because it seems to me, it has the weight of factors on the positive side. I mean, I have my little sheet here that I put down the major points and I think you've already mentioned those.

Now, I agree, too, with you, Susan, that the reuse of the soil is an important -- it's not a glamorous reuse perhaps, but it's reuse. So, we're not talking about taking it somewhere and encapsulating it and just kind of passing on the problem to somebody else. It's going to be used.

MS. FALKOFF: I think about the morality of taking good soil for a use like that and feel upset. I just feel like it's really appropriate.

MR. PORTZ: To me, that's certainly a positive issue, or a positive factor. And, then, the fact that off-site disposal is a more certain method. You know, it will work. The chemical oxidation, there's a question about

probably it will, but there's an element of uncertainty there. Certainly, to have the site available a year earlier for development purposes, I think is certainly -- it is an advantage to the town, to the entire town.

I think the negative that we have to deal with primarily is the trips, the trucks moving in and out of the community, and I think that can be handled. You know, there's going to be down sides to everything, but I think that can be appropriately dealt with.

I think, you know, the Reuse Committee and the RAB have been looking at these kinds of issues for a long time and, I mean, I appreciate Paul's point about wanted to get citizen input, but I think, also, people on the Reuse Committee and the RAB that have been looking at these issues for so long, can speak their minds and move on from there.

I don't know how you would go about doing some kind of polling of the community. I don't know how you'd do it.

MR. DENNING: We do surveys for other things.

MR. PORTZ: Pardon?

MR. DENNING: We do surveys for other things.

MR. PORTZ: Well, this is to me -- this is a somewhat technical issue. I don't know how you would poll people about whether they want a chemical oxidation versus off-site disposal.

MR. DENNING: There's a couple of citizens.

FROM THE FLOOR: It was in the papers. It was announced in all the town papers. Who showed up?

FROM THE FLOOR: Basically, we are here. Why don't you take a poll of us that are so interested and came out tonight to listen to this.

MR. PORTZ: What is your feeling, ma'am?

FROM THE FLOOR: Apparently, the off-site because it would speed things up and we're not taking a chance that the chemical oxidation may not work. So, I vote for the off-site.

MS. FALKOFF: Could you identify yourself, please?

MS. LOFTUS: I'm sorry. Mal Loftus. A resident of Watertown.

MS. FALKOFF: Anyone else?

FROM THE FLOOR: Yeah. I'm still so confused because a lot of what we heard when we were talking about cleaning up the site to residential use. One of the main arguments for not doing that was that it was going to involve digging up so much soil and trucking it away in which case the cure would be worse than the problem. This is something that was battered about at least at the level of the neighborhood. This was going to be, you know, so awful. That I heard coming out of the mouths of people as an argument against perfection precisionists.

So, this is part of the source of my concern, this

previous discussion about the conditions. Now, maybe the trucking is safer, the stuff isn't leachable. But, one of my main concerns is accountability on that trucking process and I can't say that past records, look at what happened to the GSC site. I've know we've come a long way since the days that uranium was found and they were bouncing out of barrels, but, still, that happened. And, I would like to see, you know -- I think that I would like to see a very clear community friendly effort to just make sure that that's really -- that those contractors are kept to the letter of the law and that they don't come up Irving Street and go to Dunkin Donuts over there, which certainly happens and I have every sympathy with their desire for Dunkin Donuts. I am concerned abut that.

I do also have sympathy with the desire to get this thing on the road and get it done. I completely understand that.

MR. BOYLE: We can pay closer attention in the past, than we have in the past and we have been delinquent in that.

FROM THE FLOOR: There were the Ryder trucks. There have been problems in the past that, you know, I'm not sure that -- I think at the point where the chain of command does get a little loose there, once you get a whole lot of back offers and trucker and stuff, it just gets a little

more chaotic by the nature of the game. Right? So, it would be nice, you know, if we're going to do that, then I really want to see care.

MR. BOYLE: I think that's a good plan and that if it is going to the other one that there is some type of public information or oversight process on that, including abutters, the Reuse Committee, the RAB and, obviously, the police department as well, and, Steve Lord, of the town's health directors here, as well. So, I think that is -- if that ultimately is what the decision is, that there be a process or committee or something set up because that is a very strong concern, as I said earlier, I certainly express that as well. So, I think we ought to look closely at a group that can do the public information and the oversight work, working closely with the police and health department.

MS. FALKOFF: Rich, did you?

MR. RAGO: Yeah. Based on the data set that I've seen for the whole site to date, it all seems like a waste of money to go through all this for such a low level of contamination. It's not as bad as the gas station over there and the machine shop over there or the dry cleaner next door. I would think that I emphatically would vote for off-site disposal, given this time schedule.

MS. FALKOFF: All right. Let's see if we're ready to move this toward a vote.

MR. LIAZOS: Not all the Reuse Committee members are here tonight.

MS. FALKOFF: Right. I think we'll have to specify that this is simply a -- Although, I'm not sure -- We have a number of Reuse Committee members. We may have a quorum.

MR. LIAZOS: Four RAB members. That's it.

MS. FALKOFF: We may have a quorum on the Reuse Committee.

MR. YORK: And, I think also have -- has John Arasian indicated a preference, as Cathy said?

MR. BOYLE: Well, John has indicated in a letter that he wrote, which --

MS. FALKOFF: And, Rudy Delano has, on the RAB, indicated his preference for off-site disposal, in a conversation I had with him. Tom Stevens is here. I don't know you counted Tom.

MR. STEVENS: Quite frankly, I'd rather opt for the chemical oxidation. It's a possibility it might not work, well, that leaves out one option, you know, that it might actually work. You don't know what you're going to discover as you uncover this earth for off-site disposal. You might find that the testing was insufficient to reveal some additional contamination, which was more severe, that could have been handled by the chemical oxidation. You

might wind up trying to reach a Canadian trucker that go over the Tobin Bridge with all this stuff and wind up dumping it into the harbor, and, you know, poor Deer Island, and the MWRA schedule is two years behind. So, you don't know where that's going to go.

There's a number of assumptions that are made. You're assuming that these wonderful companies are already to pack up and move to Watertown, A, aren't looking at other sites; and, B, are ready to actually commit themselves here, which isn't often the case. We have a lot of false leads. There might be another company lurking in the shadows that has a time frame of three to four years, that says, well, we can come in and solve all of life's problems in Watertown because that site is available, you know, in a couple of years. And, maybe they'd like progressive things like chemical oxidation.

I would have to opt for the more environmentally thing, rather than truck something off to a site that is slated to become a Super Fund site and my tax dollars are going to pay to clean up the stuff that came from Watertown, you know, 20 years from now, down in New Jersey, or wherever.

MS. FALKOFF: Okay, Tom. Thank you.

MR. STEVENS: I was sitting here quietly and you asked.

MS. FALKOFF: I propose that we start with the

Reuse Committee and someone make a motion.

MR. STEDMAN: I make a motion that we vote on the preference of how this is going to be handled.

MS. FALKOFF: Do you want to --

MR. STEDMAN: I would recommend that we go for the off-site disposal.

MS. FALKOFF: Okay. Someone want to second that?

MR. CHASE: Second.

MS. FALKOFF: Okay. All those in favor of off-site disposal from the Reuse Committee, raise your left hand. All opposed? Okay. Of the people present, the vote is five to one.

MR. LIAZOS: Excuse me. There are six people present. How many members of the Reuse Committee?

MS. FALKOFF: Altogether?

MR. BOYLE: Six.

FROM THE FLOOR: Five to one, that's pretty good.

MR. BOYLE: Is it Sue Persarian (phonetic) here, representing Warren. Warren's delegate is here.

MS. FALKOFF: Does Warren have a vote?

FROM THE FLOOR: I'm not comfortable voting for Warren.

MS. FALKOFF: Okay. We'll take that as an abstention.

MR. LIAZOS: I just don't see why we can't wait

another week. This is such a big decision.

MR. YORK: This is a recommendation.

MR. LIAZOS: This committee never votes on anything. This is unusual tonight. So, I'm not sure it means anything. Why is this discussion one night?

MR. YORK: I think it is important to mention several things. Cathy Sentoian has looked at it. John has looked at it long and hard. The things that are very important to me, the givens of expediting it, for getting the site development, everyone knows the benefits of that because there's a market out there.

The issue of the environmental preference, which is better, my choice, I look very strongly to the state, to the EPA, to the DEP, to Jim, and they have answered me very, very clearly, that they see this, the off-site, as safe. They see it as effective. There are some question is raised as to whether the chemical oxidation will work. It seems to me that it is a simple issue. I don't feel rushed in my vote, whatsoever, or I wouldn't make it. I think I have asked the members of the agencies, who are the experts, whether or not they felt rushed and they very clearly said no and I think they continue to say that. I feel very comfortable in the vote and I've heard the Reuse and I think we send that message along to the government.

MS. FALKOFF: Now, it seems to me, there's five

RAB members here and it may be that the RAB is not comfortable rendering a clear vote for chemical oxidation. And, I vote for off-site disposal. It may be that with Alex's feelings of being rushed and Paul's wanting to check into things further, that the RAB is not ready to --

MR. DENNING: I wouldn't want to vote. I'd abstain.

MR. LIAZOS: I would, too.

MR. DENNING: Until, you know, contrary to what Larry feels, you know, that I have polled the community and will do so. I will talk to people who live down there to see what they feel. Now, you know, Cathy Sentoian, who is someone who really is active in that area, according to Mark, feels that she would like to see it off-site because that's an important factor for me to hear. But, there are people on Frank Street, there are people all in that area that I will approach and explain it to them, so they will understand, and then I'll report back to you in some form, a letter, or whatever. I'm not sure how much time we have.

FROM THE FLOOR: And, they feel the same way you do. Off-site.

MR. DENNING: I'm going to still call because I want to know.

MS. FALKOFF: I think we probably need to direct a letter to Chuck to who? How should Paul convey his opinion?

What does the BCT think?

I think what feels most appropriate for where the RAB is, what if we simply record that there's no consensus among the RAB at this point? Rich is favoring off-site disposal. I'm favoring off-site disposal. Tom's favoring oxidation. I also have Rudy's vote for off-site disposal. Then, we have two members who want more time to think about it. I think that is perfectly consistent with our charter, that we're under no pressure to take a vote.

Does that feel comfortable for people?

MR. DENNING: Would the soil go on a bill of lading?

FROM THE FLOOR: If it goes to a Title B landfill, there are material transport records.

MS. FALKOFF: Okay. I make a motion for adjournment and would request that any further technical questions you have you address to the BCP after the meeting. Does someone want to state that motion out loud?

MR. DENNING: Do you want to set another meeting?

MS. FALKOFF: Should we adjourn this meeting? All right. The meeting is adjourned.

[Whereupon, the meeting was adjourned at 9:02 p.m.]

CERTIFICATE OF REPORTER AND TRANSCRIBER

This is to certify that the attached proceedings in the Matter of:

HEARING RE:

FEASIBILITY STUDY REPORT

REUSE PLAN

Place: Watertown, Massachusetts

Date: August 8, 1996

were held as herein appears, and that this is the true, accurate and complete transcript prepared from the notes and/or recordings taken of the above entitled proceeding.

S. French — Reporter — 08/08/96 — Date

B. Breen — Transcriber — 08/19/96 — Date

APPENDIX D

SUMMARY OF ARARS FOR THE SELECTED REMEDY

Table D-1

ARARs for Selected Remedy (Alternative S6)—Soil Excavation and Off-Site Disposal or Reuse
MTL Site, Watertown, MA

Media	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
	CHEMICAL-SPECIFIC			
Soil	FEDERAL-EPA Risk Reference Doses (RfDs)	RfDs are dose levels developed based on the noncarcinogenic effects and are used to develop Hazard Indices. A Hazard Index of less than or equal to 1 is considered acceptable.	EPA RfDs have been used to characterize risks caused by exposure to contaminants in soil. Excavation and off-site disposal or reuse of contaminated soils will minimize risks.	TBC
Soil	FEDERAL-EPA Carcinogen Assessment Group Potency Factors	Potency Factors are developed by EPA from Health Effects Assessments or evaluation by the Carcinogenic Assessment Group and are used to develop excess cancer risks. A range of 10^{-6} to 10^{-4} is considered acceptable.	EPA Carcinogenic Potency Factors have been used to compute the individual incremental cancer risk resulting from exposure to site contamination in soil. Excavation and off-site disposal or reuse of contaminated soils will minimize risks.	TBC
Soil	FEDERAL-Guidance on Remedial Actions for Superfund Sites with PCB Contamination, OSWER Directive No. 9355.4-01 (8/90)	Describes the recommended approach for evaluating and remediating sites with PCB contamination.	This guidance has been used in establishing a cleanup goal for PCBs at the site. Excavation and off-site disposal or reuse of contaminated soils will attain the cleanup goals.	TBC
	LOCATION-SPECIFIC			
Soil	FEDERAL-16 USC 470 et seq., National Historic Preservation Act and 7 CFR Part 650	Requires that action be taken to preserve historic properties. Planning action is required to minimize the harm to national historic landmarks.	MTL is a historic district and the Commander's Quarters is on the National Register of Historic Places. Army will consult with State Historic Office to ensure that actions that may cause structural damage to any building will be minimized.	Applicable

Table D-1

ARARs for Selected Remedy (Alternative S6)—Soil Excavation and Off-Site Disposal or Reuse
MTL Site, Watertown, MA
(Continued)

Media	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Soil	FEDERAL-16 USC 469A-1, Archaeological and Historic Preservation Act	Provides for the preservation of historical and archaeological artifacts that might be lost from alterations of the terrain. The Act requires data recovery and preservation activities be conducted if any project may cause irreparable loss or destruction to scientific, prehistoric, or archaeological data.	Actions involving intrusive work (e.g., excavation and construction) will require involvement of archaeologists and regulatory agencies if artifacts are found. Two known historic sites and one suspected prehistoric site are present at the MTL site.	Applicable
Soil	FEDERAL-Executive Order 11988 (Protection of Floodplains) 40 CFR 6, Appendix A	Requires that any action within a floodplain be conducted so as to avoid adverse effects, minimize harm, and restore natural and beneficial values.	Part of the River Park is a designated floodplain. Any excavation or other activities will be conducted to minimize harm and all areas disturbed will be restored.	Applicable
Soil	STATE-Massachusetts Historical Commission Regulations (950 CMR 70-71)	Establishes regulations to minimize or mitigate adverse effects to properties listed in the State Register of Historic Places. MTL is listed in the State Register. The regulations contain standards that protect the public's interest in preserving historic and archaeological properties as early as possible in the planning process of any project.	Requirements include notification to the Massachusetts Historical Commission (MHC). MHC will make a determination as to whether the actions planned will have an adverse impact. If so, the MHC and party responsible for the action will consult to determine ways to minimize adverse impacts.	Applicable
	ACTION-SPECIFIC			
Soil, Hazardous Waste	FEDERAL-Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846	This guidance document sets forth the methods for conducting TCLP testing.	The guidance will be used when testing soils at the site to determine whether they constitute hazardous waste. Any soils that are found to be hazardous will be disposed of in a licensed facility.	TBC
Soil, Hazardous Waste	STATE-310 CMR 30.300, Hazardous Waste Generator Requirements	Establishes requirements for generators of hazardous wastes.	Any generation of hazardous waste will comply with these requirements.	Applicable

Table D-1

ARARs for Selected Remedy (Alternative S6)--Soil Excavation and Off-Site Disposal or Reuse
MTL Site, Watertown, MA
(Continued)

Media	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Soil, Hazardous Waste	STATE-310 CMR 30.640, Waste Piles	Establishes requirements for waste piles containing hazardous waste.	Any piles of hazardous excavated soil will comply with these requirements.	Relevant and Appropriate, Applicable for any soil classified as hazardous waste.
Soil, Hazardous Waste	STATE-310 CMR 30.680, Use and Management of Containers	Establishes requirements for the management of containers, such as drums, that would hold field-generated hazardous waste.	Any hazardous waste containers would comply with these requirements.	Relevant and Appropriate, Applicable for any soil classified as hazardous waste.
Soil	STATE-310 CMR 19, Solid Waste Management	Establishes requirements for the treatment, storage, and disposal of nonhazardous solid waste. Has additional rules for the management of Special Waste, which is defined as solid waste that is nonhazardous for which special management controls are necessary to protect adverse impacts.	Nonhazardous excavated soil or treatment residues will be handled in accordance with substantive requirements. If soils or residues meet the definition of Special Waste, management will be in compliance with these requirements.	Relevant and Appropriate
Air	FEDERAL-CAA 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAPs)	Sets air emission standards for 189 designated hazardous air pollutants (HAPs) from designated source activities.	Sampling at MTL has indicated the presence of several HAPs in soils. Since site remediation is a designated source category (but in this case is unlikely to be a major source), NESHAPS are relevant and appropriate and all remedial activities will be designed to meet Maximum Achievable Control Technology (MACT).	Relevant and Appropriate

Table D-1

ARARs for Selected Remedy (Alternative S6)--Soil Excavation and Off-Site Disposal or Reuse
MTL Site, Watertown, MA
(Continued)

Media	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Air	STATE-310 CMR 7, Air Pollution Control Regulations	Establishes requirements for attaining ambient air quality standards by setting emission limitations, design specifications, and permitting. Watertown is in an attainment area for lead, nitrous oxide, sulfur dioxide, and particulate matter, and is in a nonattainment area for ozone and carbon monoxide. Pertinent sections of the regulation include Visible Emissions (310 CMR 7.06); Dust, Odor, Construction, and Demolition (310 CMR 7.09); Noise (310 CMR 7.10); and Volatile Organic Compounds (310 CMR 7.18).	Remedial activities will be conducted so as to incorporate Reasonably Available Control Technology (RACT) for emissions of lead, nitrous oxide, sulfur dioxide, and particulate matter, and to achieve Lowest Achievable Emission Rate (LAER) for VOCs and carbon monoxide.	Applicable (310 CMR 7.06, 7.09, and 7.10) Relevant and Appropriate (310 CMR 7.18)
Air	STATE-DAQC Policy 90-001, Allowable Sound Emissions	This policy considers sound emissions to be in violation of 310 CMR 7.10 if the source increases the broadband sound level by more than 10 dB(A) above ambient, or produces a "pure tone" condition as measured at both the property line and at the nearest inhabited residence.	Remedial activities will be conducted so as not to exceed the policy's allowable noise levels.	TBC